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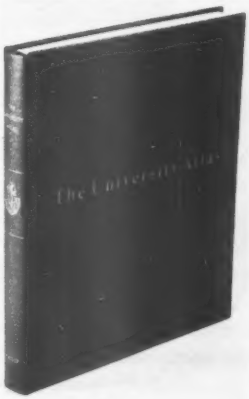

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GEOGRAPHY IN BURMA

Robert R. Drummond
Indiana State Teachers College

Geography is assuming an increasing role in the higher education programs of many of the world's younger countries. The growing place of geography in Burma illustrates this trend. Professional geography as such received its start in Burma as a division of the geology department of Rangoon University. The department was established in 1920 with the birth of the university, but the chair was not filled until 1923 with the appointment of L. Dudley Stamp. Other well-known figures to follow during the formative years under the British included H. L. Chibber, O. H. K. Spate, C. G. Beasley, J. S. Turner, H. B. Wittington, and Lester Trueblood. The separation of geography from geology came in 1948.

The imprint of the British education system is still much in evidence. The student who begins his university work in geography has already received substantial grounding in the science. From the first standard to the matriculation examination, which comes after the completion of the ninth (or terminal) standard, the student has continuously received instruction in geography. In most state schools outside the larger cities, geography is the only course which can actually be equated as a science.

At the end of the ninth year (a tenth may shortly be added) the student may elect to take the matric examination which qualifies him to enter either of the two universities (Rangoon and Mandalay) or one of the five intermediate colleges. Those who attend the intermediate colleges transfer after two years to the universities. Examination is compulsory in mathematics, Burmese, and English. The student must choose two other subjects on which to write, and 10,000 each year include geography; of these, 3,000-5,000 regularly pass. Since success in the matric examination opens the door to a university education paid for by the government, it is of the highest importance. The examination and the resulting scores make national news. Students receiving top scores are marked for important careers in the professions and the government.

The matric questions which confront the student in geography cover a broad scope of physical, climatic, economic, and regional material. Part of the examination is practical, including problems dealing with maps and statistics. The average American student would be ready for this examination only after a full year of university-level geography.

First year geography majors at the two universities totaled 393 in the academic year 1957-58. During the first year the student takes physiography, climate, and practical geography (laboratory). He ordinarily attends an hour's lecture per week in each course. If he follows the syllabus closely, there is plenty to keep him busy until the next lecture. Some examinations may be given during the year, but the deciding test comes in

March after the eight months of lectures have been completed. Failure in one subject means failure for the whole year.

In the second year classes are given in selected regional courses. Burma and Monsoon Asia, Western Europe, and Anglo-America are ordinarily included. Laboratory work is continued. Successful completion of the annual examination allows the student to enter the final two years of university work. During the third year he takes geomorphology, human geography, geography of manufacturing, the Middle East, and the Mediterranean, as well as a more advanced laboratory course. This is followed in the fourth year with courses on soils and plant geography, political geography, the Indian Subcontinent and the Far East, land use, and additional practical or laboratory work.

The student is not given a choice of subjects, although the courses may be altered somewhat to suit world conditions. During the past few years greater emphasis has been placed on regional studies of the Far East. Regional courses concerned with areas south of the equator are not now being taught.

The annual examinations produce a high casualty rate among the students. The numbers of geography students in the various undergraduate years during the academic year 1957-58 at the two universities were as follows:

	Rangoon	Mandalay	Total
First Year	175	218	393
Second Year	169	131	300
Third year	42	31	73
Fourth Year	32	9	41
Regular degrees granted, 1958	13	6	19

A rapid increase in recent years in numbers of students selecting geography as a major is partly responsible for the contrast in numbers between the first two and last two years.

At the end of the second year the students may take a qualifying examination for admission to honors work. Courses taught under the three-year honors program are of a definitely higher standard, and require the completion of numerous research papers. A thesis at the end of the honors program requires a measure of original field work. Special honors courses include physical geography, climatology, soils, and regional courses dealing with Europe, Asia, and North America. Other courses included are historical geography, political geography, and land use. Honors students are taught field methods during the vacation between terms which comes in October. This field period may last from a week to ten days.

The honors thesis is based on the results of individual field work. Usually the student is given a problem in his home district. The problem is certain to contain plenty of field mapping and cartographic work. The honors student learns cartography in his laboratory classes. It is possible to complete an honors program in three years, although it usually takes the student somewhat longer. The honors degree ranks just below the American masters degree as it is constituted in most American univer-

sities. Seven honors degrees were scheduled for completion in 1958 at Rangoon University; at Mandalay University honors work has just begun.

If the student, upon receiving the honors degree, elects to pursue graduate work, he has a distinct advantage. He may complete the masters program in two years, while the non-honors graduate must prepare for four years of concentrated effort. At present the masters degree program is carried on only at Rangoon University. The honors degree student spends his first year of graduate work in courses which will prepare him for a series of qualifying examinations, covering the entire field of geography. The test consists of four papers which are in many ways comparable to the qualifying examination for the American Ph.D. Having qualified, the student can elect either to write a thesis or to prepare for a further and even more rigorous examination. Most graduate students prefer the thesis option. Preparation of a thesis requires at least one and often two years. The thesis program in recent years has been directed toward a systematic survey or geographical inventory of each of Burma's larger political subdivisions. Field work is often long and arduous. The growing list of completed theses represents the best available regional studies of Burma. The masters degree ranks somewhere between the American masters and the Ph.D. Eight masters degrees have been awarded since the beginning of the program at Rangoon University in 1952. Six are in progress (1958).

Employment opportunities for the holders of bachelors, honors, and masters degrees is far greater than the supply. The government services claim all but a few. Civil administration, the Land Records Department, the Education Department, and the Burmese military are the most popular with geographers. Some of the honors and masters graduates are also added to the staffs of the intermediate colleges.

Professional work by the Rangoon University staff has included the completion of an atlas with emphasis on the physical and economic geography of Burma. This atlas, done under the direction of Dr. Daw Thin Kyi, is entirely in the Burmese language. Dr. Thin Kyi, chairman of the Rangoon department, has also served on the National Planning Commission and is presently directing a geographical survey of the Sittang Valley under a grant from the Asia Foundation.

Training of the staffs of the two universities is broad and international in nature. Dr. Thin Kyi has her doctorate from Clark University; Dr. Pe Thaung and Dr. Tin Htoo, also of the Rangoon staff, hold their degrees from Syracuse University. At Mandalay the head of geography, U Thein Maung, and another staff member, Mr. Edward Renny, have masters degrees from Clark. Among others of the sixteen staff members regularly employed at the two universities, one is currently completing doctorate work in England and another is working toward a masters degree, also in England. The rest of the staff members hold degrees from Rangoon University.

MEETING THE NEEDS FOR GEOGRAPHERS

Guy-Harold Smith
Ohio State University

The need for teachers of geography at the college level is well known to the chairman of every department of geography or dean who has the responsibility of securing properly prepared personnel to man the numerous classes that must be taught. In the universities an important share of the teaching in the beginning courses is in the hands of assistants, teaching assistants, assistant instructors, and other junior staff personnel who are only partially prepared for their responsibilities. Most of them are serving as part-time teachers while they continue work on an advanced degree. The recruitment of qualified graduate students is a necessary first step in building up the roster of qualified geographers to meet the needs of education, government service, and business.

The recruitment of students for the graduate schools of the universities is a difficult and delicate problem in the case of the students who are uncertain about what course to follow. The counselor, the professor, or friend who undertakes to advise graduating seniors to seek an advanced degree must give careful attention to the ethical, biological, and economic aspects of recruitment. Students are being encouraged to continue advanced work in mathematics, engineering, and the physical sciences. No doubt some will undertake work for which they are not properly prepared. There is the need for a balanced distribution of graduate students among the several disciplines in so far as the needs can be envisaged.

Many graduating seniors who are well qualified from the standpoint of intellectual capacity are unwilling to enter a graduate school for one or more reasons. Many students have exhausted their financial resources and find it necessary to seek employment and start earning a living. Before or at the time of graduation many students marry and the problem of going on to graduate school is or may be complicated by family responsibility. Many young wives are unable or unwilling to continue the period of financial hardship while their husbands earn advanced degrees when they know that the immediate economic advantages are not clearly discernible.

The increase in enrollments in colleges and universities is likely to outrun the rate at which prospective teachers can be recruited and trained. The situation in geography is not unlike that in many other fields. The graduate schools in the American universities are now enrolling students that were born in the late 1930's when the birth rate was just beginning to show an upturn from the low levels of the depression years. The depression both slowed the birth rate and reduced the opportunity for many students to gain a graduate education, so that today the number of available teachers in the 25-30 year old group is insufficient to meet the needs of increasing enrollments which result from a higher birth rate and greater prosperity. The demand for teachers has been so great that many people have been induced to enter or re-enter the teaching profession with less than the generally prescribed qualifications for employment.

The Handbook-Directory of The Association of American Geographers, published in 1956, is a source of valuable information which can be useful to us as we make preparations to meet the need for geographers in the next few years when we know that the need will be great. In checking this roster of members of the Association data on 476 persons were tabulated to give some indication of the time interval between the baccalaureate degree and the doctorate. The minimum time required is three years. Only 14 out of 476 or 2.9 per cent of the geographers with the Ph.D. were able to satisfy the requirements in three years. Thirty-eight or 8.0 per cent received the degree in four years. Thirty-three or 6.9 per cent required five years. This means that only 17.8 per cent of the 476 tabulated received the doctorate in three to five years after receiving the baccalaureate degree.

Slightly more people received the Ph.D. degree after an interval of six years than for any other number of years though a seven-year interval was next in order. The periods most frequently required or at least taken to secure the doctorate are six, seven, and eight years but from the data it is evident that the period may be drawn out to 10, 12, or more years. The average length of time between the first degree and the doctorate is 10.1 years but 197 of the 476 persons received the degree more than 10 years after graduation from college. More than a quarter, or 27.1 per cent, received the degree after an interval of 11 to 15 years. Eight per cent took 16 to 20 years and slightly more than four per cent took from 21 to 37 years to get the degree (see accompanying table).

In a paper prepared by the Office of Scientific Personnel, National Academy of Sciences-National Research Council, entitled "Production of U. S. Scientists," it is stated that "The typical B.A.-Ph.D. time interval for the natural sciences is four or five years; in the other fields it is approximately twice this time." (Science, March 28, 1958, pp. 682-686. Reference on page 684.) The time span for earning the Ph.D. degree in geography on an average is substantially longer. Perhaps this indicates that most geographers are in fact social scientists.

Many persons can explain their slowness in earning the Ph.D. degree by a time loss of two or more years because of military service or government employment during World War II. Many students are still called upon to discharge their military obligations either before or after receiving their first degree. In many instances the G.I. benefits that veterans have received made it possible for them to complete their graduate education in a relatively short time. Many geographers have had the advantage of foreign travel and residence while serving their country. Military service has been both a hindrance and an advantage in the field of graduate education.

It is not implied that the interval of several years between the baccalaureate and doctoral degrees is an exact statement of the time required to attain the Ph.D. degree in geography. Many persons find it necessary for economic or other reasons to interrupt their graduate education for one or more years after receiving the baccalaureate or the Master's degree. Many candidates for the Ph.D. degree complete all requirements

except the dissertation, and then find their funds so depleted that they accept a full-time position. If these breaks can be eliminated or shortened a larger number of qualified persons will be available for the geography positions now vacant. This will help to meet the immediate need for geographers. The long-term needs will have to be met by recruitment of more graduate students qualified to complete the requirements for the Ph.D. degree.

It is clear from the data presented here that the great need for qualified geographers can be met chiefly by finding a way to reduce the time taken to get the Ph.D. degree among those who normally take from six to fifteen

From Baccalaureate to the Doctorate

Years	Number	Per cent
3	14	2.9
4	38	8.0
5	33	6.9
6	51	10.7
7	50	10.5
8	40	8.4
9	35	7.4
10	28	5.9
11	32	6.7
12	29	6.1
13	30	6.3
14	22	4.6
15	16	3.4
16	13	2.7
17	5	1.1
18	8	1.7
19	9	1.9
20	3	.6
21	2	.4
22	5	1.1
23	3	.6
24	3	.6
26	2	.4
27	2	.4
28	1	.2
36	1	.2
37	1	.2
	476	

years. It may well be that the urgency of the present situation will produce a new time schedule somewhat at variance with the past as shown by the accompanying data. However, some of the delaying factors are still operative.

Most graduate students are unable to meet the requirements of the doctoral program in a period of three to five years. Many of them are unable to finance their advanced studies and only a few can expect to secure fellowships covering the whole period of study. Generally they must seek part-time employment to pay tuition, fees, and living expenses. As an inevitable consequence the years drag on. The language requirement has become a delaying factor. Many students enter upon the graduate study of geography without having taken a foreign language in college. Many have taken Latin or Spanish in high school only to find that the graduate school of their choice requires German and French for the doctorate. Perhaps it would be fair to say that most graduate students take at least one and perhaps two years to satisfy the language requirement. Generally the language and other requirements are met concurrently but time elapses and the date when the degree will be received is postponed.

Any tendency to reduce the language requirement can have the effect of lessening the time required to earn the Ph.D. degree. In spite of the renewed discussion of the language requirement with the hope in some quarters that the requirement can be eliminated or at least reduced, it is obvious that the mastery of one or two foreign languages has functional usefulness to geographers. There is little evidence at present that the ranking graduate schools in the training of professional geographers leading to the Ph.D. degree are planning to reduce or simplify the language requirement.

The preparation of an acceptable dissertation is also a slow process for many candidates for the Ph.D. degree. The necessary field work, library research, and writing are time consuming. If the candidate becomes heavily involved in teaching at the university where he expects to receive the degree the teaching responsibility tends to take precedence over research and writing. If he has found it necessary to accept a full-time employment he may find that he has little time to devote to his dissertation. Many graduate schools now have a statute of limitations which gives the candidate a specific number of years for the completion of the dissertation after passing the general examination. Yet many students abandon their research and never return to get the Ph.D. degree.

If there is to be a speed-up in the training of geographers it may be suggested that a year or two or even more may be cut off the graduate training period by urging undergraduate students to take the languages that can be quickly up-graded to meet the language requirement for the Ph.D. degree. The graduate committees can exert pressure on students to make more rapid progress on the dissertation and thus qualify for the degree sooner. Many students enter the graduate school, satisfy the residence requirement, meet the language requirement, accumulate the necessary credits in courses and seminars, and pass the general examination. They then accept a full-time position and the demands of the new job make it

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very difficult for them to complete their dissertations. At this point the employing institution might render an important service by insisting that the dissertation be completed in a specific number of years and then arrange the teaching load so the candidate will have time to work regularly on the dissertation.

If more geographers are to be trained at high standards the departments of geography that have graduate programs must give particular attention to the immediate need for well qualified geographers. If the training period can be shortened by as much as a year for those who otherwise might take five or more years the number available in the next few years may be increased slightly. But recruitment in the face of urgent call for more engineers and physical scientists is a first and necessary step.

THREE-DIMENSIONAL MAPS FOR ARCHIPELAGOES

Earl J. Senninger, Jr.
Flint Junior College, Flint, Michigan

Presentation of the results of geographic research on archipelagoes very often poses special cartographic problems. The size and fragmentation of archipelagoes does not always allow the use of standard cartographic techniques, particularly for depicting quantitative information. Presenting data on a large number of small islands commonly results either in a map becoming too cluttered with information or having to draw each island on a separate map. Neither of these methods is entirely satisfactory, because the former is not easily read and the latter results in a loss of space relationships.

The complexity of island sizes and shapes often presents another problem, that of selecting symbols of an appropriate size. One type or style may be too overpowering for the small islands and yet not bold enough for the larger islands. This problem also presents great difficulty in achieving balance which is so important in any map.

This paper describes a system for presenting quantitative data concerning archipelagoes, making use of the technique of three-dimensional maps. This technique is not new in cartography. It is, however, a technique that is little used in island cartography.

A map made according to the procedure outlined below would have a three-dimensional appearance. Each island on such a map would be projected up from its base location by a measured amount in accordance with the data being used. Each island will resemble Figure E. The vertical scale for such a map would be developed to fit both the data and the particular archipelago.

The procedure for projecting each island up vertically from its base can be accomplished by the following steps:

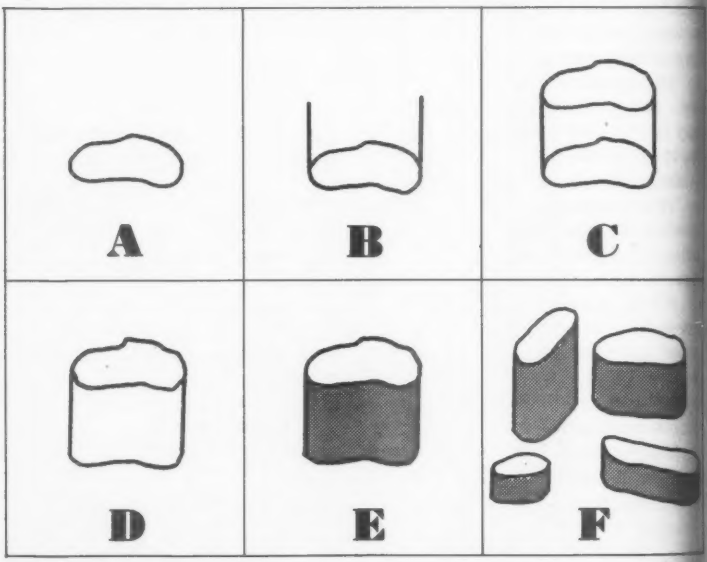
1. Prepare a pencil-drawn base map of the island group, as illustrated by single island in Figure A.
2. Draw vertical pencil lines up from the right and left edges of

each island (Figure B). The lengths of these lines are governed by each island's datum and the data scale used on the map.

3. Project the individual island "bases" up so they will become the tops of the islands (Figure C). This is accomplished by placing a piece of drafting paper which has the pencil outline of the islands under the piece of drafting paper that will become the finished map. This bottom piece is then moved so that the outline of each island comes into contact with the tops of the vertical pair of lines for each island that was drawn in step 2.
4. Erase the unnecessary pencil lines at the back portions of each island base so the map takes on a three-dimensions appearance (Figure D).
5. Ink in all lines and use Neutral Tint India Ink or a Zip-A-Tone type of material on the raised portion of each island to make them more prominant (Figure E). Figure F is an example of what several hypothetical islands might look like after being projected up according to the above procedure.
6. Finish the map with title, scale, legend, island names, and any other necessary information.

A variety of quantitative data, such as population density, value of imports, value of exports, import tonnages, export tonnages, value of agricultural crops, sales revenues, and tourist numbers can be thus graphically expressed.

This technique offers several advantages. (1) Cartographic detail is kept to a minimum because the height of each island serves as a symbol



for the information being shown. (2) All islands can be shown on one map without a loss of space relationships. (3) The map is easily understood because its interpretation is achieved simply by a comparison of the island heights. (4) Only a minimum of cartographic training is necessary to construct maps of this type.

It would be a fallacy to state that this technique can be used for all archipelagoes and data. The locations and sizes of the islands, as well as the data, determine whether or not this technique can be employed. One obvious difficulty is that a projected island may contact or overlap an island north of it. In some cases this can be solved by shifting the projected part slightly to the east or west. Another limitation is that this technique can be employed to present only one type of data per map. To present a variety of data it is necessary to construct as many maps as there are types of data.

FURTHER COMMENTS CONCERNING "GEOGRAPHIC" AND "ECONOMIC" ECONOMIC GEOGRAPHY

Brian J. L. Berry
University of Chicago

The paper by Luckermann (1) which appeared in an earlier edition of The Professional Geographer made several valuable points. One can readily agree that in the search for a more scientific economic geography the criterion of "goodness" of theory should not be congruence with models in physical science, but with the empirical realities of economic geography. Too, it should be recognized that any "explanation" derived is limited to the logical consequences of empirically valid axioms, hypotheses, and assumptions. (Such explanations being of the character: If A, B, and C, then D. D is "explained" by A, B, and C, and the explanation is "good" if empirical materials cannot disprove the conditions A, B, and C, at a given level of probability.)

But valid as these points may be, one must take issue with several implications Luckermann drew from them regarding use of certain procedures by the economic geographer. There is need for comment, for example, on the following statement:

> "Concepts of equilibrium, equipossibility, minimization of cost/effort, optimim solution, and theory of games, sets and fields are mechanical assumptions presupposing an idealized continuous process or a sequence of determinative results. The use of such concepts in social science assumes complete knowledge of all causal factors present, pre-determined ends (minimization/maximization), and a single (point) solutions. The acceptance by geographers of such models to interpret human behavior is certainly less than an empirical approach."

It would be wrong to conclude that because congruity with models in physical science is not acceptable as a test of "goodness" that use of the

tools, concepts, and models cited is invalid (i.e., less than an empirical approach). Because we can represent decline in population densities from a city center by an exponential decay function $y = Ae^{-bx}$ does not mean that a physical criterion of goodness is accepted. Neither does interpretation of probability, for example, in a set theoretical context, imply a mechanistic interpretation of reality. One writer has described scientific work as "doing one's damnedest with one's mind, no holds barred." Use of such models simply reflects this tendency. Isard describes the ultimate goal as the attempt to "gain penetrating insights" (2). It is sufficient for the models to contribute to this. Any model is a means to an end: the common goal of understanding our spatially-varying economic life. If the best model or miniature of spatial variations has the same form as some model in physical science it is coincidence and not proof of a social physics or what have you. Neither does it imply that the researcher who subsequently uses this model assumes the value of physical congruity. If it helps describe a little better, see a little more clearly, this is justification enough. And use does not preclude "an empirical approach" for the test, say, of a minimum effort assumption as against reality. Proof of the pudding is in the eating.

In view of this, the assertion that "A more geographic economic geography would start from observations with the recording of data on maps" needs some examination. Is it valid to argue that "Research in geography would begin with the description of geographic phenomena and associations so arranged and ordered?" This is a common view expressed frequently in methodological notes in geography. It is apposite to ask whether continued emphasis upon description is efficient. As Zetterberg (3) remarks "the quest for explanation is the quest for theory." A theory or model, when tested and validated, provides a miniature of reality and therefore a key to many descriptions. There is a single master-key instead of the loaded key ring. To accept this, of course, implies that observation is necessarily proceeded by the hunch or hypothesis which needs to be tested against reality, by problem-orientation rather than by inventory.

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(1) Luckermann, F., "Toward a More Geographic Economic Geography," The Professional Geographer, Vol. X, 1958, pp. 2-10.
(2) Isard, W., Location and Space Economy, New York: Wiley, 1956.
(3) Zetterberg, H. L., On Theory and Verification in Sociology, Stockholm: Almqvist & Wiksell, 1954.

ASSOCIATION AFFAIRS

Special Report

The January issue of The Professional Geographer is in two parts. The first part contains the material regularly appearing. Part II is the special report "Status and Trends of Geography in the United States, 1952-1957" by Clarence F. Jones, prepared for the Pan American Institute of Geography and History. Its publication as part of The Professional Geographer was approved by the AAG Council. Ruth E. Baugh was the Guest Editor for this report, and the AAG Secretary and Central Office handled the copy preparation.

NOMINATIONS FOR 1959

The Nominating Committee presents the following candidates for officers and councilors:

For President	Paul A. Siple
For Vice President	Jan O. M. Broek
	Charles B. Hitchcock
For Treasurer	George F. Deasy
	John K. Rose
For Councilor	Samuel N. Dicken
	Fred B. Kniffen
	Harold H. McCarty
	Alfred H. Meyer

John R. Borchert
Louis O. Quam
Thomas R. Smith, Chairman

BIOGRAPHICAL INFORMATION SUPPLIED BY CANDIDATES

Nominee for President:

Paul A. Siple, Ph.D.
Director, Polar Research Division
Office, Chief of Research & Development
U. S. Army

Experience with AAG business: Member of Council 1950-52; Chairman, later Consultant, Committee on Geographers in National Defense 1951-55.

Experience - Administrative or Executive: Head, Biology Department and Leader, Marie Byrd Land, Sledging Party - Byrd Antarctic Expedition II 1933-35; Geographer and Supervisor of Logistics 1939-41; Chief of Climatology and Environmental Protection Div., Office, Quartermaster

General, U. S. Army 1941-46; Director of Environmental Research, U. S. Army General Staff 1946-53; Director of Basic Research, Office, Chief of Research & Development, U. S. Army 1954-55; Chairman, U. S. Army Committee on Environment 1947-55; Chairman, Personnel Selection Board IGY 1955-56; Scientific Leader, IGY South Pole Station 1956-57; Director, Polar Research Division, Office, Chief of Research & Development, U. S. Army 1958; Member of U. S. National Committee for IGY 1958; Member, IGY Antarctic Committee 1958; Chairman or member of numerous Ad Hoc Committees associated with geographic and research subjects 1951-55.

Nature and Extent of Research: Extensive military-geography research involving climatology, (Director of Climate Zone Map Series Monthly for all continents except Antarctica) Human Climatology; Wind Chill; Clothing Almanacs, etc. Application of Climatology to building design published variously by National Research Council, BRAB, American Institute of Architects and House Beautiful Magazine. Polar Research, e.g., Proceedings of the American Philosophical Society, Vol. 89, No. 1, April 30, 1945, "Reports on the Scientific Results of the U.S. Antarctic Service Expedition, 1939-41." Geographical Exploration from Little America III, the West Base of the U. S. Antarctic Service Expedition, 1939-41, pp. 23-60. Measurement of Dry Atmospheric Cooling in Subfreezing Temperatures, pp. 177-99 (with Chas. F. Passel - Geologist), General Principles Governing Selection of Clothing for Cold Climates, pp. 199-234; and many others.

Nominees for Vice President:

Jan O. M. Broek, Ph.D.
Professor of Geography
University of Minnesota

Experience with AAG business: Councilor; chairman and member of various committees.

Experience in administration: Chairman, Department of Geography, University of Utrecht, and University of Minnesota.

Geographic fields of interest: Human Geography; regionally, Southeast Asia.

Charles B. Hitchcock

Experience with AAG business: Council AAG 1947-50; Treasurer during AAG-ASPG amalgamation.

Experience in administration, presiding at meetings, etc.: Assistant Director, American Geographical Society 1943-48; Executive Secretary AGS 1949-52; Director AGS 1953-; Chairman, U. S. Advisory Committee on American Cartography 1948-56; Deputy Chairman, Research and Development Panel 1949-50; member, National Research Council Committee on Geography Advisory to ONR 1951-53; Chairman 1951-53; member, National Research Council Advisory Committee on Geography to Pan American Institute of Geography and History; Alternate U. S. member 1958-; member, Executive Committee, Division of Natural

Sciences, National Research Council for two periods and of other committees including National Atlas Committee; U. S. Delegate, International Geographical Union, Amsterdam 1938, Rio de Janeiro 1956; U. S. Delegate, Commission on Cartography, Pan American Institute of Geography and History, Caracas 1946, Buenos Aires 1948, Santiago 1950, Ciudad Trujillo, Mexico City 1955; Advisory Committee on Fulbright Fellowships in Geography for one year.

Nature and extent of research: Head, Department of Hispanic American Research 1938-52 and Editor, Map of Hispanic America 1:1,000,000 during this period. Field Work: Venezuela, American Museum of Natural History 1929, Phelps expeditions to South Venezuela 1947, 1948, 1950, 1951, 1954, and 1955.

Nominees for Treasurer:

George F. Deasy, Ph.D.
Professor of Geography
Pennsylvania State University

Experience with AAG business: Council 1949; Committee on Trends in Training and Placement of American Geographers 1954-58; Membership Committee 1958-; active in formation of ASPG, The Professional Geographer and the Regional Divisions.

Experience with financial matters: Treasurer ASPG 1944-48; one of principals in transfer of ASPG funds to AAG treasury.

Experience on working committees: In addition to AAG and ASPG committee work served on numerous academic and governmental committees.

Nature and extent of research: Author of over 40 professional geographical articles in various scholarly publications. Co-author Atlas of World Affairs (Crowell, 1946) and The World's Nations (Lippincott, 1958); classified geographical research for Department of State and Department of the Army, 1941-47.

John Kerr Rose, Ph.D.
Senior Specialist in Conservation and Natural Resources
Legislative Reference Service, Library of Congress

Experience with AAG business: Vice President 1945 and President 1946, ASPG; Council 1948-50; AAG delegate to Section E of the AAAS.

Experience with financial matters: Legal aspects in connection with work in the law firm Spaulding, Reiter and Rose.

Experience on working committees: Constitution and Constitutional Revision Committees, AAG; Honors Committee 1958; much committee work within Federal agencies.

Nature and extent of research: Twenty-two years as geographer and economist in several agencies of the Federal Government; most recent publication "Survey of National Policies on Federal Land Ownership," Senate Document No. 56, 85th Congress, 1st Session, 1957.

Nominees for Councilor:

Samuel N. Dicken, Ph.D.
Professor and Head, Department of Geography
University of Oregon

Experience with AAG business: Member of the Nominating Committee 1947-48; Editorial Board 1951-54; Chairman, Nominating Committee 1957-58.

Experience as spokesman for a group and as a member of working committees: President of the Association of Pacific Coast Geographers 1951-52; Member and Chairman of various University committees at the University of Minnesota and University of Oregon, including interdisciplinary, course and international affairs committees; Committee on Geography, Advisory to the Office of Naval Research, NRC, 1957-.

Other experience: Head, Department of Geography and Geology, University of Oregon 1947-57; Head of the Geography Branch, Birratz American University 1945-46.

Fields of geographic interest: Economic geography, especially land use; Geomorphology, karst and marine terraces; Regional geography, especially Kentucky, N.E. Mexico, and the Pacific Northwest.

Nature and extent of research: Field and library studies in Minnesota, Kentucky, N.E. Mexico, and the Pacific Northwest; numerous articles in the Annals, Economic Geography, and other geographical periodicals; a monograph for Soil Conservation Service.

Fred B. Kniffen, Ph.D.
Professor and Head, Department of Geography and Anthropology
Louisiana State University

Experience with AAG business: Chairman, Southwestern Division; Council; member of Editorial Board, Annals; member of Nominating Committee, Program Committee, Committee on Geography of the Americas; Chairman, Committee on Research Grants; Host group for AAG annual meeting.

Experience as spokesman for a group: Departmental head; Director of field camp for four summers; Chairman, N.R.C. Committee on Geography, Advisory to the Office of Naval Research.

Experience on working committees: See above. N.R.C. Committee on topographic maps illustrating settlement; Committee on Rural Settlements, American Geography, Inventory and Prospect; numerous academic committees.

Fields of geographic interest: Cultural geography; Anglo-America; historical geography.

Nature and extent of research: Geography of historic and prehistoric American Indians; origin and diffusion of diagnostic American traits; settlement forms and folkways of the lower Mississippi Valley; joint author of college text; some fifty books, monographs, and articles; numerous reviews.

Harold H. McCarty, Ph.D.
Professor and Chairman, Department of Geography
University of Iowa

Experience with AAG business: Divisional Chairman, West Lakes Division; member of Editorial Board, Annals.

Experience in administration and in presiding at meetings: Chairman, Department of Geography, University of Iowa, since 1946; chairman of numerous round-table and other groups of geographers, AAG.

Experience in presenting geography to non-geographers: Lectures to local academic groups, service clubs, and regional associations.

Nature and extent of research: Economic, industrial, and U. S. regional studies. Emphasis on quantitative approaches.

Alfred H. Meyer, Ph.D.
Professor and Head, Department of Geography and Geology
Valparaiso University

Experience with AAG business: Chairman, Nominations Committee 1954; Chairman, Program Committee 1956-57 and again now a member of Program Committee; Planned, and presided at the Social Geography sectional program for the 50th Anniversary meeting; currently appointed Chairman of Program Committee of East Lakes Division 1958-59; regular attendant and several times program participant in AAG meetings; currently AAG delegate to the American Association for the Advancement of Science.

Experience as spokesman for a group: President, National Council for Geographic Education (NCGT, 1947), after serving on the Executive Board and as Vice President; membership on committees of NCGE; President of the Indiana Academy of Science 1955-56; President, Indiana Academy of the Social Sciences 1956-57; responsible for planning its general session program; sponsored "initiation" of the Geography sectional membership into this society; President, Valparaiso City Plan Commission (1948-50), after sponsoring the organization of the Valparaiso Citizen's Advisory Planning Council and serving as its first chairman.

Experience on working committees: Besides as noted above, chairman of the Survey Committee of Valparaiso University committee to an overall institutional self-survey.

Experience in administration and teaching: Present administrative position since 1933; college teaching since 1926, including summer guest lectureship at eight institutions.

Field of geographic interest: Social, historical, and political geography; geographic planning; geographic education.

Nature and extent of research: A score of research articles published in academic and other professional journals; collaboration in several book-writing projects.

PRELIMINARY PROGRAM
AAG 1959 Pittsburgh Meetings
Hotel Penn-Sheraton

Sunday, March 29

4-10 p.m. . . . . Registration — 17th Floor
1-6 p.m. . . . . Industrial Valleys Field Trip (Monongahela and Allegheny valleys)
1-5 p.m. . . . . National Academy of Sciences - National Research Council Advisory Committee on Geography to the Department of State — Parlor B
7 p.m. . . . . AAG Council Meeting — Parlor B

Monday, March 30

8 a.m.-10:45 p.m. . . . Registration — 17th Floor
9 a.m.-12:30 p.m. . . . Field Trip: Appalachian Reconnaissance by Air
10:45-11:45 a.m. . . . . General Welcoming Session — Ball Room
1:30-3:30 p.m. . . . . Three Concurrent Sessions

A. Geographic Thought in Foreign Countries — Ball Room
George Hoffman (University of Texas), presiding
(Arranged by the chairman)

1. Hans H. Carol (Zurich University) - Current Geographic Thought in the German Language Area
2. Josip Roglic (University of Zagreb) - Geographic Thought in Yugoslavia
3. Antoni Kuklinski (Institute of Geography of Polish Academy of Sciences) - Polish Industrial Geography: Some Problems of Research
4. Hilgard O'Reilly Sternberg (University of Brasil) - Geographic Thought and Development in Brazil
5. Chiao-Min Hsieh (The Catholic University of America) - Geography in Communist China

B. Measurement & Regional Geography — Urban Room

1. Brian J. L. Berry (University of Chicago) - Statistical Tests of Value in Grouping Geographic Phenomena
2. Gary S. Dunbar (University of Virginia) - A History of the Regionalization of Virginia
3. Charles T. Stewart, Jr. (Washington, D.C.) - The Hinterland Reconsidered
4. Jack Richard Villmow (Ohio State University) - Regional Contrasts Within Berlin, Germany
5. Mary Megee (University of Chicago) - The Extent of Influence of Monterrey, Mexico

C. Cartography — Monongahela Room

1. Leerie Summers (Aeronautical Chart & Information Center) - The Evolution of Shaded Relief Portrayal on Aeronautical Charts
2. George F. Jenks (University of Kansas) - Selection of Area Shading Patterns for Maps
3. Nelson C. Clark (Aeronautical Chart & Information Center) - The Continuous Habitation Patterns of India & Pakistan as a Cartographic Problem
4. John E. Dornbach (Aeronautical Chart & Information Center) - The Mental Map
5. Erwin Raisz (University of Florida) - The Atlas of Florida

4 p.m. . . . . Reception & Tea — University of Pittsburgh

5-6 p.m. . . . . Special Party — Office of Naval Research

8-9 p.m. . . . . Regional Science Association — Allegheny Room

Technical Materials of Interest to Regional Scientists
Walter Isard (University of Pennsylvania), presiding

8-10 p.m. . . . . Three Concurrent Sessions

A. Pennsylvania Geography — Ball Room

E. Willard Miller (Pennsylvania State University), presiding
(Arranged by the Chairman)

1. C. Josephine Moyer (State Teachers College, Kutztown) - The Psychological Factors Operating Against Incorporation of Greater Reading
2. Lester E. Klimm (University of Pennsylvania) - Some Patterns on the Pennsylvania Landscape
3. George F. Deasy (Pennsylvania State University) - Regional Differences in Primary Energy Sources for the Generation of Electricity in Pennsylvania
4. Gerald J. Karaska (Pennsylvania State University) - The Basic-Nonbasic Concept Applied to an Anthracite Mining Community
5. Henry Madison Kendall (Miami University) - Agricultural Patterns in Pennsylvania
6. William B. Stockdale (Chesapeake & Ohio Railway Co.) - Population Movements as Effected by an Upper Ohio River Basin Flood Control Project

B. Transportation Geography — Urban Room

1. Frank H. Thomas (Northwestern University) - The Capture Ratio: A Measure of the Relationship Between the Railroad and Its Region
2. Frank Seawall (Ohio State University) - Transportation Regions of the Monongahela River
3. Albert G. Ballert (Great Lakes Commission) - On the Eve of the Seaway Era: Great Lakes - Overseas Trade and Traffic
4. Thomas Frank Barton (Indiana University) - The Largest Railway Net in Continental Southeast Asia
5. Aubrey Diem (State University Teachers College, Potsdam) - A New Route Through the Alps: The Mont Blanc Tunnel

6. Benjamin E. Thomas (University of California, Los Angeles) - Climate and Transportation in Interior West Africa

C. Report from Antarctica — Monongahela Room
Paul Siple (Department of the Army), presiding

1. Paul Dalrymple (Quartermaster Research & Engineering Command) - The Quartermaster Corps Microclimatic Program in Antarctica During the IGY
2. James A. Shear (University of Kentucky) - Some Observations on Antarctic Circulation
3. Arthur E. Jorgensen (Rutgers University) - Preliminary Investigation of Mean Temperature at the Amundsen - Scott IGY South Pole Station
4. Palle Mogensen (Station Scientific Leader, Amundsen-Scott South Pole Station) - Geographical Polar Navigation and Atmospheric Refraction at Low Altitudes

Tuesday, March 31

7:30 a.m. . . . . Special Breakfast
Society of Woman Geographers

8:30-10:30 a.m. . . . . Three Concurrent Sessions

A. Population of the Caribbean Realm — Ball Room
Glenn Trewartha (University of Wisconsin), presiding
(Arranged by the Chairman)

1. William W. Winnie (Louisiana State University) - General Features of Population Change and Migration in the Caribbean Area
2. Roy Chung (University of California, Berkeley) - Population Growth and Redistribution in the British West Indies
3. Paul Simkins (University of Wisconsin) - New Maps of Population Distribution in Central America
4. Robert Nunley (Wayne State University) - Regional Geography and the Distribution of Population in Costa Rica
5. David Lowenthal (American Geographical Society) - Population Contrasts in the Three Guianas
6. John P. Augelli (University of Maryland) - Racial and Cultural Complexity of West Indian Population: The Case of Trinidad

B. Land Utilization & Agricultural Geography — Urban Room
Alfred H. Meyer (Valparaiso University), presiding

1. A. A. Michel (Yale University) - An Overexpanded Irrigation Project in an Underdeveloped Nation: Some Problems of the Helmand Valley Project in Afghanistan
2. Pradyumna P. Karan (University of Kentucky) - The Pattern of Land Utilization and Possible Expansion of Cultivated Area in Nepal
3. John Hiltner (Bowling Green State University) - The Commercialization of Agriculture in the Turkish Chukurova

4. Leonard Zobler (Columbia University) - A Proposed Food Resource Efficiency Statement for the United States and Japan
5. Robert E. Huke (Dartmouth College) - Ifugao Rice Terraces
6. George P. Patten (Ohio State University) - Problems Facing the Nicaraguan Dairy Industry

C. Geomorphology Monongahela Room

1. Bogdan Zaborski (University of Ottawa) - The Role of the "Development of Surface" in the Description of the Relief
2. M. Gordon Wolman (Johns Hopkins University) & L. M. Brush (Iowa Institute of Hydraulics) - Experimental Study of Factors Controlling the Size and Shape of Stream Channels in Coarse Non-cohesive Sands
3. John Richard Sheaffer (University of Chicago) - A Geographic Approach to Stream Classification: Flood Events
4. Stephen S. Visher (Indiana University) - Streams
5. Frank O. Ahnert (University of Maryland) - The Influence of Pleistocene Climates upon the Morphology of Cuesta Scarps on the Colorado Plateau
6. Dieter Brunnschweiler (Michigan State University) - Periglacial Features in North America and Their Climatic Implications

10:45 a.m.-12:15 p.m. . . Five Panel Discussion Groups Ball Room

A. The Pattern of the Warming Trend of the Past One Half Century, Its Probable Cause and Future Trends

George D. DeLong (Eastern Michigan College), presiding

Panel: Hurd C. Willett (Massachusetts Institute of Technology)
Earl E. Lackey (Quartermaster Research & Engineering Center)
Jack R. Villmow (Ohio State University)

B. The Role of Value Judgments & Prediction in Geography Urban Room

Peter H. Nash (University of North Carolina), presiding

Panel: Paul Yluisaker (Ford Foundation)
Patrick J. Cusick (Pittsburgh Regional Planning Commission)
Sherwin S. Cooper (University of North Carolina)

C. Southwest Asia Monongahela Room

George B. Cressey (Syracuse University), presiding

Panel: Saul B. Cohen (Boston University)
Nicholas Helburn (Montana State College)
H. Louis Kostanick (University of California, Los Angeles)
Alexander Melamid (New York University)
John R. Randall (Ohio State University)

D. Experience with Electronic Computers in Geographic Research
Allegheny Room
Howard G. Roepke (University of Illinois), presiding
Panel: Brian Berry (University of Chicago)
Robert Klove (Bureau of the Census)
Edwin Thomas (University of Iowa)
William Warntz (American Geographical Society)

E. Accent on the Visual Parlors B and C
Robert J. Goodman (Wayne State University), presiding
Panel: Aubrey Diem (State Teachers College, Potsdam)
Donald Keillar (University of Puerto Rico)
E. Willard Miller (Pennsylvania State University)
Robert B. Monier (USAF, Ret.)

12:30 p.m. . . . . Special Luncheons
Indiana University
University of Illinois

2-4:30 p.m. . . . . Three Concurrent Sessions

A. Admiral Robert E. Peary Commerative Program Ball Room
Paul Siple (Department of the Army), presiding
(Arranged by the Chairman)

1. Herman Friis (National Archives) - American (U.S.) Participation in the Discovering of the North Pole
2. Donald W. Hogue (Quartermaster Research & Development Command) - Temperature Differences on the Greenland Ice Cap
3. Fernand de Percin (Quartermaster Research & Development Command) - IGY Investigations at Lake Peters, Mt. Chamberlin, Brooks Range, Alaska, during Summer 1958
4. Sigmund J. Falkowski (Quartermaster Research & Development Command) - Climatic Frequency Data for the Northern Hemisphere
5. John C. Cook (Southwest Research Institute) - Antarctic Exploration and Development in the Coming Half-Century

B. Mineral and Energy Geography Urban Room

1. Robert B. McNee (City College, New York) - Centrifugal - Centripetal Forces in International Petroleum Company Regions
2. Lee Guernsey (Indiana State Teachers College, Terre Haute) - The Reclamation of Strip Mined Lands in Western Kentucky
3. Phyllis R. Griess (Pennsylvania State University) - Localization of High-Efficiency Coal Mines in Western Pennsylvania
4. Jack C. Mowll (Martin Company) - The Economic Geography of Nuclear Process Heat
5. John W. Webb (University of Minnesota) - The Settlement Hierarchy of the Mesabi and Vermilion Ranges, Minnesota
6. Graham Humphrys (McGill University) - The "Montferre" Mining Region, Southern Labrador - Ungava
7. J. Granville Jensen (Oregon State College) - Mexico, World Competitor in Frasch Sulfur

C. Cultural Geography — Monongahela Room

1. George F. Carter (Johns Hopkins University) - Origin of Easter Island Writing
2. Marvin W. Mikesell (University of Chicago) - "Arabs" and "Berbers": A Problem in Cultural Geography
3. Theo L. Hills (McGill University) - La maree francaise - Appalachian Quebec
4. John E. Brush (Rutgers University) - The Succession of House Types and Styles in Central New Jersey
5. Charles B. McIntosh (University of Nebraska) - Side-Tracked Villages in East Central Illinois
6. Sister Mary Ursula (Mount Aloysius Junior College) - Changing Patterns of Catholic Population in Eastern United States
7. Cheng-Tsu Wu (Hunter College) - New York Chinatown

4:45-6 p.m. . . . . AAG Annual Business Meeting — Ball Room

5:15 p.m. . . . . Special Party
University of Wisconsin

6:30 p.m. . . . . Special Dinner
University of Michigan

8-9 p.m. . . . . Open Meeting of the Bureau of the Census Advisory Committee — Allegheny Room
John Fraser Hart (Indiana University), presiding

8-10 p.m. . . . . Three Concurrent Sessions

A. Geography of Manufacturing — Ball Room

1. Lloyd D. Black (U.S. Department of Commerce) - Industrial Development for Rural Areas?
2. William Zelinsky (Chesapeake & Ohio Railway Co.) - Is Industry Dispersing from the American City? The Evidence for the 1939-1954 Period
3. Charles W. Boas (Michigan State University) - Locational Patterns of American Automobile Assembly Plants 1895-1958
4. Alfred H. Meyer & Elmer B. Hess (Valparaiso University) - Gary Manufactural Design and Destiny
5. Henry L. Hunker (Ohio State University) - Ashtabula: A Study of Location Factors in the Chemical Industry
6. Vincent P. Miller (College of Wooster) - Paper Production of the Western Ontario Basin: An Example of Industrial Conflict and Adaption
7. Ying-Cheng Kiang (Eastern Illinois University) - The Chinese Garment Industry in San Francisco

B. Population Geography — Urban Room

1. William Warntz (American Geographical Society) - Macrogeography and Some Aspects of a Demographic History of the United States, 1790 to 1950
2. Frank C. Innes (McGill University) - Colonization in the Quebec Clay Belts
3. Anthony Sas (University of Maryland) - Some Problems Associated with the Integration of Dutch Rural Settlers in Southwestern Ontario

4. Frederick Hung (Carroll College) - Notes on the Geographic Study of Population of Monsoon Asia
5. Philip W. Porter (University of Minnesota) - An Historical Geography of the Peopling of Liberia
6. Kirk H. Stone (University of Wisconsin) - Norwegian Frontier Settlement
7. Paul P. Vouras (Paterson State College) - Ecological Variations in the Villages of Greece

C. Soils and Plant Geography and Resource Development
Monongahela Room

1. David S. Simonett (University of Kansas) - The Role of Rainfall in Soil Formation on the Basalts of North Queensland
2. James M. Blaut (Yale University) - Cultural Determinants of Soil Erosion: A Case Study from Jamaica
3. Robert L. Carmin (University of Illinois) - Forest Versus Grassland Soils of Central Brazil
4. David J. DeLaubenfels (University of Georgia) - Australian Forests Compared with the Vegetation of Similar Climatic Areas in the Americas
5. L. A. Peter Gosling (University of Michigan) - Recent Introductions of Plants and Animals into Northeastern Malaya
6. Geoffrey John Martin (Coral Gables, Florida) - An Enumeration of the Natural Problems Attendant Upon any Reclamatory Scheme for the Florida Everglades

Wednesday, April 1

7:30 a.m. . . . . Special Breakfasts
Clark University
Ohio State University

8:30-10:30 a.m. . . . . Three Concurrent Sessions

A. Soviet Union & Eastern Europe — Ball Room

1. George W. Hoffman (University of Texas) - Regional Integration and Cooperation in Eastern Europe: The Satellite Countries and the Soviet Union
2. Huey Louis Kostanick (University of California, Los Angeles) - Population Patterns in Poland
3. David J. M. Hooson (University of Maryland) - The Middle Volga: An Emerging Focal Region in the Soviet Union
4. Fred E. Dohrs (Wayne State University) - Changing Land Use Patterns in the Central Ukraine
5. Paul E. Lydolph (Los Angeles State College) & Theo. Shabad (New York Times) - Soviet Oil and Gas: Recent Exploration and Utilization
6. Robert D. Picher (University of Washington) - Power Potential of the Angara - Yenesei Region of the Soviet Union

B. Cultural Geography Urban Room

1. Adam A. Pepelasis & Kenneth Thompson (University of California, Davis) - Institutional Limitations to Land Resource Development in Greece
2. Herbert L. Rau, Jr. (Kansas State College) - The Impact of a Technical Assistance Program on Agricultural Land Use Patterns in the Sabana de Bogota, Colombia
3. Walter Deshler (University of Maryland) - Livestock Trypanosomiasis and Human Settlement, Some Relationships Observed in Northeastern Uganda
4. John Fraser Hart (Indiana University) - Censal Year of Maximum Negro Population in the Eastern United States
5. Forrest R. Pitts (University of Oregon) - The Myths of Tokugawa Isolation and Stagnation
6. Paul Wheatley (University of Malaya) - Geographical Notions of a Chinese Official of the Southern Sung
7. Robert B. Monier (USAF, Ret.) & Herbert J. Vent (Air University) - Photo Interpretation: A Key to Radiation Studies of Survivors of the Hiroshima and Nagasaki Nuclear Explosions

C. Commercial Geography - Ports & Trade Monongahela Room

1. Richard E. Carter (Chicago Area Transportation Study) - A Comparative Analysis of United States Ports
2. Kerlin M. Seitz (University of Wisconsin, Milwaukee) - Milwaukee's Outside, Inside, Outside Harbor
3. Richard J. Houk (De Paul University) - Mocamedes, Modernized Gateway to Southern Angola
4. David A. Smith (Pennsylvania State University) - Contrasts in Inter-Island Transportation in the Hawaiian Islands and Lesser Antilles
5. Otis P. Starkey (Indiana University) - The Transit Trade of Barbados
6. Robert E. Gensler (U.S. Government) - The Suez Canal and Middle East Oil
7. Kempton E. Webb (Indiana University) - Problems of Urban Food Supply in Brazil

10:45 a.m.-12:15 p.m. . . . Five Panel Discussion Groups

A. The Changing Face of Africa Ball Room

William A. Hance (Columbia University), presiding

Panel: L. Gray Cowan (Columbia University)
Hibbard V. B. Kline, Jr. (Syracuse University)
Karl J. Pelzer (Yale University)
Benjamin E. Thomas (University of California, Los Angeles)

B. Teaching Geography in Our Secondary Schools Urban Room

Clyde F. Kohn (State University of Iowa), presiding

Panel: Preston E. James (Syracuse University)
Clarence W. Olmstead (University of Wisconsin)
Gilbert F. White (University of Chicago)

C. Applied Political Geography — Allegheny Room
Fred E. Dohrs (Naval War College), presiding
Panel: Robert T. Ramsauer (Air Force Academy)
James M. Hunter (Georgetown University)
Andrew Gyorgy (Naval War College)

D. Problems in the Making of a New World Map of Population — Parlors B and C
Allen K. Philbrick (Michigan State University), presiding
Panel: Clarence Odell (Denoyer-Geppert Co.)
Robert Brown (St. Cloud State College)
Wilbur Zelinsky (Chesapeake & Ohio Railway Co.)
Elaine Bjorklund (Vassar College)

E. Geography & Water Resource Problems — Monongahela Room
Eleanor E. Hanlon (Syracuse University), presiding
Panel: Erich F. Bordne (University of Pittsburgh)
Douglas B. Carter (Syracuse University)
Daniel Jacobson (Montclair State College)
Lorrin Kennamer (University of Texas)

12:30 p.m. . . . . Special Luncheons
University of California, Los Angeles
State University of Iowa

1:30 p.m. . . . . AAG Council Meeting — Parlor E

2-4:30 p.m. . . . . Three Concurrent Sessions

A. Conservation — Ball Room
Guy-Harold Smith (Ohio State University), presiding
(Arranged by the Chairman)
1. Louis A. Wolfanger (Michigan State University) - Some New Horizons in Soil Conservation and Land Use
2. E. Willard Miller (Pennsylvania State University) - World Patterns and Trends in Energy Consumption
3. Thomas B. Nolan (U.S. Geological Survey) - Research and Our Natural Resources
4. Lawrence A. Hoffman (Ohio State University) - Dynamics of Population and Resource Development

B. Agricultural Geography in the United States — Urban Room
Wesley Calef (University of Chicago), presiding
1. Lorrin Keimamer, Jr. (University of Texas) - Irrigation Patterns in Texas
2. Robert E. Cramer (East Carolina College) - Agricultural Developments on the Pamlico Peninsula, Eastern North Caroline: A Study in Drainage Reclamation
3. James P. Latham (University of Pennsylvania) - Characteristics of Distribution in Pennsylvania Cropland Region
4. Kenneth Thompson (University of California, Davis) - English Walnuts: The Relocation of a Major California Crop
5. Tom McKnight (University of California, Los Angeles) - Wild Horses in Western Anglo-America

6. Richard E. Dahlberg (University of California, Los Angeles) - Recent Developments in the Chautaugua-Erie Grape Industry
7. Luella N. Dambaugh (University of Miami) - The "Hole in the Donut" - A Microcosm

C. Urban Geography — Monongahela Room

1. Roland J. Fuchs (University of Hawaii) - Intraurban Variation of Residential Quality
2. Edward J. Taaffe (Northwestern University) - The Urban Hierarchy and the Gravity Model: An Empirical Definition
3. Clyde E. Browning (Chicago Area Transportation Study) - The Occupational Structure and Functional Role of the Chicago Central Business District
4. George K. Lewis (Boston University) - Changes in Suburban Land Use Patterns
5. Peter H. Nash (University of North Carolina) - Interdisciplinary Approaches to the Study of Emerging Polynuclear Metropolitan Regions
6. Jerome P. Pickard (Washington Board of Trade) - Functional Size and Regional Location of Major Metropolitan Areas of the United States in 1956
7. Neil M. McArthur (University of Maryland) - A Community Service Approach in Land-Use Analysis

8 p.m. . . . . Annual Banquet — Ball Room

Address by the Honorary President, Steven Jones
Yale University
"Boundary Concepts and Zeitgeist"

Thursday, April 2

9 a.m.-12:30 p.m. . . . Field Trip - Urban Renewal

9-11:30 a.m. . . . . Three Concurrent Sessions

A. Political Geography — Ball Room

1. James M. Hunter (Georgetown University) - Parallel Ideas of Ratzel and Hartshorne in the Methodology of Political Geography
2. G. Etzel Pearcy (Department of State) - Measurement of the U. S. Territorial Sea
3. Alexander Melamid (New York University) - Partitioning Cyprus
4. Peirce F. Lewis (Pennsylvania State University) - A Cartographic Analysis of Voting Behavior
5. Vincent H. Malmstrom (Middleburg College) - The American Impact on Iceland: A Geographical Appraisal
6. Edward J. Miles (Valparaiso University) - The Geography of Political Attitudes: Some Methodological Considerations
7. Edmund R. Thompson (United States Military Academy) - Mapping a State-Idea: Malaya, a Case Study

B. Geography of Manufacturing & Marketing Geography
Urban Room

1. Albert S. Carlson (Dartmouth College) - The Spread of Industry into Inland New England: An Example from the Upper Connecticut Valley
2. William H. Wallace (University of New Hampshire) - Recent Trends in Merrimack Valley Manufacturing: The Post-War Era
3. S. Earl Brown (Ohio State University) - Scranton's Unfulfilled Industrial Integrity
4. Robert A. Harper (Southern Illinois University) - The Impact of Political Factors on Manufacturing in the Illinois Portion of the St. Louis Metropolitan Area
5. Saul B. Cohen (Boston University) & William Applebaum (Harvard University) - Evaluating Store Sites and Determining Rents: An Aspect of Applied Geography
6. James R. Wray & Robert S. Collins (National Outdoor Advertising Bureau, Inc.) - Geographical Aspects of Market and Media Information Needed by Buyers of Poster Advertising

C. Climatology
Monongahela Room

1. Henry J. Warman (Clark University) - On the Effects of Urbanization on Duirnal Temperatures
2. Sigismond de R. Diettrich (University of Florida) - The Freeze of 1957-58 and Florida's Citrus Industry
3. Howard L. Ohman & Iven Bennett (Quartermaster Research & Development Center) - Oasis Modification of Desert Temperature and Humidity
4. Earl E. Lackey (Quartermaster Research & Engineering Center) - A Nomographic Method of Assessing Hourly Temperature Frequencies from Limited Weather Records
5. Wesley C. Calef (University of Chicago) - Winter Air Mass Climatology of the Northern Great Plains
6. Thomas M. Griffiths (University of Denver) - Observations on the Regime of a Dry Polar Glacier
7. James J. Parsons (University of California, Berkeley) - "Fog Drip" from Summer Stratus, with Special Reference to the Berkeley Hills

REGIONAL DIVISIONS

East Lakes

The fall meetings of the East Lakes Division were held on October 10 and 11 in Bloomington with Indiana University as host. John Fraser Hart, Chairman of the Division, was in charge of the program.

The theme of the meetings was "How can we Improve the Status of Geography in the Schools?" John W. Morris, Secretary for the National Council for Geographic Education, delivered the keynote address at the annual banquet. His title was "Geography Versus the School and You." On the second day, Professor Morris moderated a panel discussion on the general Theme. The panel included Thomas F. Barton of Indiana University, Robert J. Goodman of Wayne State University, Shirley H. Engle, of the Indiana University School of Education and John W. Coulter of the University of Cincinnati.

At a short business meeting Paul A. Siple, Vice President of the AAG, brought news from the national organization. The secretary's report showed a divisional membership of 191 persons.

The Division's spring meetings will be held in Toledo, Ohio. Al Ballert, of the Great Lakes Development Commission, will be in charge of local arrangements. The meetings will include a field trip of the Toledo port area.

Alfred H. Meyer extended an invitation to the Division to hold the 1959 fall meetings in Valparaiso, Indiana. The meetings will coincide with the institution's centennial celebrations. The invitation was accepted.

---Robert Sinclair, Secretary-Treasurer

Great Plains - Rocky Mountains

The annual meeting of the Division was held at the University of Kansas, Lawrence, on October 10 and 11. Over 80 members and students attended the banquet and address in the Kansas Memorial Union. In the absence of Leslie Hewes, who currently holds a Fulbright Grant in Austria, the Chairman's address was waived. Instead, an interesting and critical analysis of East European agricultural and industrial development was given by Norman Pounds, the Visiting Rose-Morgan Professor of Geography at the University of Kansas.

The Saturday field trip, organized by the Department of Geography emphasized soils and agriculture of the Lawrence vicinity and included a trip to the Flint Hills.

David Simonett, University of Kansas, is President for 1958-59. Clark N. Crain, University of Denver, is Program Chairman and Vice Chairman. Tentatively, a meeting in the Pueblo, Colorado, area is being planned for the 1959 autumn meeting.

---David Simonett, Chairman

New England-St. Lawrence Valley

"The Changing Geography of the Mid-Connecticut Valley" was the theme of the 33rd Annual Meeting of the New England-St. Lawrence Valley Geographical Society on October 18. The morning sessions and luncheon were held in the Student Union at the University of Massachusetts, Amherst. Following a registration-coffee hour, three papers were presented:

"New Concepts on the Geomorphology of the Connecticut Valley" - Richard Lougee, Clark University

"The Changing Recreational Land Use of the Connecticut Valley" - Albert S. Carlson, Dartmouth College

"Material for Teachers on the Connecticut Valley" - Ella Keene, Keene (N.H.) State Teachers College

Election of officers was the only item on the agenda at the annual business meeting. Shannon McCune, Provost of the University of Massachusetts, continues as President of the Society (Chairman of the AAG Division) for the coming year. Henry J. Warman of the Graduate School of Geography, Clark University was elected First Vice President and George M. Howe, Travelers Weather Service, Travelers Insurance Company became Secretary-Treasurer.

Lester Klimm, President of the Association of American Geographers, was luncheon speaker, bringing greetings and information from the Association to the Society and reminiscences of his youth in the Amherst area.

More than 100 members participated in the afternoon field trip along the Connecticut Valley from Amherst to Greenfield, and then to the Deerfield River site of the Yankee Atomic Electric Company plant near the river's headwaters. Dinner at the Weldon Hotel in Greenfield was followed by a colored film about the Connecticut River, "The Wonderful Valley."

The Program was arranged by President McCune and H. T. U. Smith of the University of Massachusetts, Minnie Lemaire of Mt. Holyoke College, Lillian Wallace of Westfield (Mass.) State Teachers College, and E. R. Foster, Executive Director of the Connecticut Valley Watershed Council.

---George M. Howe, Secretary

Southeastern

The Thirteenth Annual Meeting of the Southeastern Division of the Association of American Geographers was held November 23-25, 1958, at Memphis State University, Memphis, Tennessee, with approximately 80 geographers in attendance.

Monday and Tuesday were devoted to the presentation of papers, discussions, and the annual business meeting. The highlight of the meeting was the dedication of Johnson Hall, the beautiful new geography and social science building at Memphis State, on Monday evening, November 24.

Rayburn W. Johnson has devoted some thirty years to the development

of geography at Memphis State University. During this period he has created one of the larger geography departments in Southeastern United States. One of his greatest and certainly his most spectacular contribution is Johnson Hall which he planned and designed and to which he contributed an amount of money equal to all the salary paid him by Memphis State University in his more than 30 years of service there. Johnson Hall is completely air conditioned and is most effectively arranged and equipped for the teaching of geography and related social sciences. There are two floors of classrooms, offices, laboratories, a large auditorium, and headquarters for the Memphis Geographical Society. The basement contains some additional classroom space and the attractive Ethel B. Johnson reception room.

The dedication ceremony, attended by the visiting geographers as well as local guests and friends, was an impressive occasion. J. Russell Whitaker gave the main address, "Geography and Geographers in American Education." Following the dedication a portrait of Dr. Johnson was unveiled. The evening concluded with a reception in the Ethel B. Johnson Reception Room.

At the annual banquet Tuesday night, November 25, Lester E. Klimm, President of the AAG, gave a stimulating address on "Some Challenges and Opportunities in the Field of Geography."

The membership voted to hold the next meeting in a hotel on the Mississippi Gulf Coast under the sponsorship of the University of Alabama and Mississippi State College.

New York Metropolitan

Many geographers from this area took an active part in the annual meeting of the National Council for Geographic Education, held in New York at Thanksgiving. The division has had two fall meetings. The November 14th meeting concerned city planning, emphasizing the techniques used by city planners in land use studies. Millard Humstone and Samuel Mozes of New York City Planning illustrated their talks with many large maps and diagrams. A very lively discussion followed, led by John Brush and Richard E. Harrison. The second meeting, December 12, was held at the American Geographical Society and was devoted to "our own work." Stimulating short papers were given by Leo Toch, Glenn Stephenson, Julius Kaikow, Leonard Zobler, Leonard Tow, and Kurt Rothschild. The great diversity of topics indicated the very wide interests of the area's geographers. The division plans another mid-winter meeting and a spring field trip. The programs are arranged by Charles C. Morrison, Vice Chairman. Other officers for 1958-59 are Alexander Melamid, Chairman, Robert B. McNee, Secretary, Daniel Jacobsen, Treasurer, and William Hance and John Dean, Councilors.

---Robert B. McNee, Secretary

ANNOUNCEMENTS AND REPORTS

Non-Commercial Exhibits for Pittsburgh Meetings

Members desiring to exhibit research materials at the AAG 1959 Annual Meetings in Pittsburgh should correspond directly with the exhibits representative of the Cartography Committee, James J. Flannery, Geography Department, University of Pennsylvania, Philadelphia, Pa. Letters should contain such information as kinds of exhibits, space requirement, and shipment date.

Albert J. Nystrom Memorial Fellowship for Advanced Study in Improving the Teaching of Geography in Elementary and Secondary Schools

This fellowship, established in memory of Albert J. Nystrom by the company which he founded, is intended to encourage students who seek to improve the teaching of geography in elementary and secondary schools.

It is open to students in institutions in Canada and the United States having the following qualifications:

1. Completion of all or most of the language and course requirements leading to a Doctor of Philosophy or Doctor of Education degree; and
2. An acceptable program for research and writing leading to a dissertation in some aspect of the teaching of geography.

The recipient is expected to devote the fellowship period largely to research and writing of the dissertation.

The fellowship award is $2,400 for one year and normally will not be granted to a given recipient for more than one year.

The recipient may select the department of geography in which he wishes to pursue his advanced study provided the department of geography within the university selected offers opportunities for advanced study in the teaching of geography, or the school of education in cooperation with the department of geography offers such opportunities.

The A. J. Nystrom Company stands ready to assist in publication of the research results if it seems suitable to do so.

Applications must be received by March 1, 1959. Send applications to Dr. Clyde F. Kohn, Department of Geography, State University of Iowa, Iowa City, Iowa. The award will be announced on or about March 15.

Application blanks should be requested from: Secretary, Association of American Geographers, The Library of Congress, Washington 25, D. C.

Funds for Educational Communication

The Office of Education has announced that it is prepared to consider applications for Federal funds to support research projects in educational television, radio, motion pictures, and related communications media. At present, applications for research grants or contracts may be made by letter or on the form now utilized by the Cooperative Research Program.

Inquiries concerning the new research program should be directed to the Director, Communications Media Research Program, Office of Education, Department of Health, Education, and Welfare, Washington 25, D. C.

SWG Fellowship in Geography

The Society of Woman Geographers is offering one of its Adelene Moffat Fellowships of $2,700 to a young woman to do graduate work in geography at Columbia University for the academic year 1959-1960. To qualify, students must be acceptable for admission to Columbia University under the Graduate Faculties and have a B.A. degree or its equivalent. A good background in the social sciences and in general geology or geography is desirable, but candidates who have given evidence of superior ability in other fields are also eligible.

Application must be made on the Columbia University fellowship application form with an indication that it refers specifically to the Society of Woman Geographers Fellowship in Geography. Applications must be received by February 20, 1959, and applicants will be advised of the award on or about April 1, 1959. Qualified applicants will also be considered for other fellowships, scholarships, and grants-in-aid offered by Columbia University.

Further information and application blanks may be obtained from Office of University Admissions, 322 University Hall, Columbia University, New York 27, New York.

AAG 1959 Pittsburgh Meeting

The 55th AAG annual meeting will be held in Pittsburgh on March 29 to April 2, 1959, with the Penn-Sheraton Hotel serving as the headquarters hotel. Each member will soon receive a hotel reservation card and information concerning other hotels and motels. The headquarters hotel advises that room reservations should be made at least 10 days before the opening of the convention.

Three major field trips are planned in connection with the meeting: (1) a tour of the industrial Monongahela and Allegheny river valleys in the vicinity of Pittsburgh by special train on the Pittsburgh and Lake Erie Railroad - Sunday afternoon, March 29; (2) an air tour of the Appalachian Plateau, Allegheny Front, and folded Appalachians - tentatively scheduled

for Monday morning, March 30, and (3) a bus tour of the redevelopment aspects of Pittsburgh's Urban Geography - Thursday morning, April 2. Descriptions of these field trips and registration forms will be sent to AAG members; advanced registration is required for the field trips scheduled for Sunday afternoon and Monday morning.

All sessions of the AAG program will be provided with visual aids equipment and services as required. A detailed information sheet and a questionnaire concerning visual aid utilization have been mailed to program participants.

Attention is directed to the announcement on page 11 concerning non-commercial research exhibits for the AAG meeting.

Key personnel of the Local Arrangements Committee are serving in the following capacities:

Audio and Visual Aids - Leonard I. Kuntz (Chr.), Henry W. Castner (Ass't Chr.)
Banquet - Mary Viola Phillips (Chr.)
Exhibits - Erich F. Bordne (Chr.), Edward W. Hanten (Ass't Chr.)
Field Trips - Gerard J. Foster (Chr.), Carole C. Bradley (Ass't Chr.), Ralph F. Jackson (Air Trip Director)
Hospitality and Information - James M. Jennings (Chr.), Mary Viola Phillips (Ass't Chr.)
Press, Radio, and Television - Donald Ballas (Chr.)
Registration - James M. Jennings (Chr.), Zoe A. Thralls (Ass't Chr.)

Norman Carls, Chairman, AAG Local Arrangements Com.
Geography Dept., 1309 C.L.
University of Pittsburgh
Pittsburgh 13, Pennsylvania

NCGE

The 44th Annual Meeting of the National Council for Geographic Education was held November 28-29, 1958 at the Statler Hilton Hotel in New York City. Approximately 800 were in attendance with 300 attending the annual banquet at which Paul A. Siple spoke on "Widening Horizons in the Antarctic." The Distinguished Service Award recipient was Otis Willard Freeman.

The officers elected for the coming year:

President: Adelbert K. Botts, State Teachers College, Trenton, N.J.
First Vice President: John W. Morris, University of Oklahoma.
Second Vice President: Lyle Fletcher, Bowling Green State University
Secretary: Lorrin Kennamer, Jr., University of Texas
Treasurer: John H. Garland, University of Illinois
Executive Board: H. Phillip Bacon, Teachers College, Columbia; Mamie Anderzhon, Oak Park Schools, Oak Park, Ill.

The 45th Annual Meeting of the NCGE will be next Thanksgiving in Detroit, Michigan.

Student Reading List

The Department of Geography at Syracuse University has published an annotated list of essential works recommended for the Ph.D. student in geography. This list presents a minimum number of standard geographic works that contain substance of geographic research in each of the major fields. Copies of "Basic Readings in Geography" may be obtained from the Department of Geography, Syracuse University, Syracuse 10, New York, at forty cents each to cover cost of postage and handling.

The Placement Committee

The Placement Committee has now published the first two issues of Jobs in Geography and distributed them to members who are actively registered with the Committee. JIG 3 will be released in mid-January. Any AAG member wishing to register with the Committee should request a Placement File Data card, fill it out, and return it to the Committee. Not until this card is received will his name be entered on the active list. If a geographer who filed a card in the past did not receive copies of JIG, his name has probably been dropped from the active list for any one of a number of reasons. For example, he may not have renewed his card when it became out of date; he may have indicated that he was not currently interested in a new job; or he may have failed to reply to notices. Any such members who filed data cards during 1958 will be reinstated upon request; those who filed cards earlier than 1958 should request and submit new cards to the Committee.

Association of Pacific Coast Geographers

The 22nd annual meeting of the Association of Pacific Coast Geographers will be held in San Diego on Tuesday, Wednesday, and Thursday, June 16, 17, and 18, 1959. Preliminary plans call for the reading of papers on Tuesday and Wednesday. The annual banquet is scheduled for Wednesday evening, a field trip of the local area on Thursday.

NEWS FROM GEOGRAPHIC CENTERS

Wayne State University-Antioch College

The Wayne State University-Antioch College geography field program was held during August and early September in Yellow Springs, Ohio. This is probably the first experiment of a large state university and a small private college cooperating on a program of this kind. The course was on a graduate level, although several undergraduate majors were enrolled. Eight Wayne students, and three Antioch students, participated.

The program provided as broad an introduction as possible to various phases of geographic field work, but at the same time reflected the Wayne State department's emphasis on urban studies. The first week dealt with basic mapping techniques and the physical landscape. Landforms, soils, and vegetation were mapped and the physical complex was analyzed. During the second week, the farm economy was studied. Agricultural land use was mapped in detail, farm interviews were conducted, and the spatial relationships of small rural communities were delineated. The third week involved urban and industrial field techniques. Land use mapping was done in the Dayton commercial core and in an outlying mixed neighborhood. Shopping districts were analyzed. Interviews were conducted with industrialists. In the fourth week, a comprehensive study was made of a 15 square-mile area in the Dayton rural-urban fringe. Land use was mapped in detail, changes in land use, economy and agriculture were studied, and the problems arising from these changes were considered. In general, an attempt was made to analyze the nature and principles of urban sprawl within the area. During the final week, students were left on their own to solve individual problems, most of which were of an urban nature and involved methods utilized during the preceding weeks. Between the second and third weeks of the course, a more extensive weekend field excursion was made through the Kentucky Bluegrass region, the Natural Bridge State Park, the Cumberland Mountains and the Middle Ohio Valley.

The program was enhanced by the rich diversity of physical and cultural landscapes in the Yellow Springs region. Moreover, the facilities of the Antioch Outdoor Recreation Center proved to be an ideal base for operating such a field program. The course was conducted by Robert Sinclair of Wayne State University and John F. Lounsbury of Antioch College.

Michigan State University

During the past year the department has added two new courses, and made changes in the physical plant. Geography of Polar Regions was offered for the first time during winter quarter by Dieter H. Brunnschweiler who also initiated Advanced Aerial Photo Interpretation in the fall term,

1958. The former staff drafting room has been converted into graduate assistant offices.

The department is participating in a study of Michigan Highways in cooperation with the University Highway Traffic Safety Center, Michigan State Highway Department, and U. S. Bureau of Public Roads. Robert S. Vogel and Thomas E. Niedringhaus are analyzing the economic and social impact of highways on the land in Michigan, especially the changes between 1940-1955. The work is under the direction of Allen K. Philbrick who also conducted field studies for 9 weeks during the summer. His project includes the making of a gross land use map of the 30 counties of the southern third of Michigan's Lower Peninsula.

Field training was again offered by the department at the Michigan State Kellogg Gull Lake Biological Station during the summer of 1958 under the direction of Charles W. Boas. The field use of aerial photography was stressed in both rural and urban situations. Members of the on-campus staff visited the camp for informal field seminars. Thomas E. Niedringhaus was assistant for the summer field course.

Charles C. Colby, Director, The Mississippi River Investigations, will be Distinguished Visiting Professor for 1959 spring term and will conduct a seminar on the "Theory and Practice of Area Development." Lynn H. Halverson, Chairman, Department of Geography and Earth Science, Northern Michigan College, was Visiting Professor for the summer session. The department participated in the Summer Institute on Asia offering a geography of the Southern and Southwest Asia. Shannon McCune, Provost, University of Massachusetts, was a visiting lecturer for the Institute, addressing a general assembly on the topic "Korea Today." In August, Samuel Van Valkenburg, Director, Clark Graduate School of Geography, participated in a Social Science Institute held on the Michigan State campus. Other visitors to the department during the year included Charles M. Davis, Chairman, Department of Geography, University of Michigan, A. Denis Baly, Kenyon College, who addressed Departmental Seminars, Earl Shaw of the State Teachers College of Worcester, Massachusetts, and Richard J. Houk, DePaul University, who presented a program on African problems for the Geography Club and a Departmental Seminar.

Allen K. Philbrick delivered a paper in the Urban Geography session on "Composite Urban Hinterlands" at the Santa Monica AAG meetings and presided at an informal session on cartography. He is completing a world regional geography text. Lawrence M. Sommers was appointed to the National Research Council Committee on Geography, Advisory to the Office of Naval Research. During the spring and summer quarters he participated in a Faculty Seminar on the evaluation of the role of a university in fields of international economics and business, one of several seminars on the Michigan State Campus financed by a Ford Foundation grant. Paul C. Morrison continues to represent the department in the Interdisciplinary Seminar in the Behavioral Sciences. Edward C. Prophet taught the on-campus summer session and continues his series of radio programs on "Geography in the News." During the fall quarter he is offering

a non-credit adult education course in Grand Rapids under the auspices of the College of Science and Arts, Liberal Arts Adult Education Program and the Department of Continuing Education. In August, Professor Prophet toured SAGE installations in the northeastern United States with the State of Michigan Curriculum Committee called "Living in the Air Age." Clarence L. Vinge taught the summer session and continues work on a college level text in economic geography. Dieter H. Brunnschweiler was Visiting Professor for the summer session at Central Washington College of Education in Ellensburg. He participated in the panel discussion on the impact of the IGY at the AAG meetings. Robert S. Vogel was a Visiting Instructor at Central Missouri State College at Warrensburg during the summer.

Four staff members have received All University Research Grants for 1958-59: C. W. Boas for "Locational Concentration in the American Automotive Industry," D. H. Brunnschweiler - "Studies on the Climate of the Southern Hemisphere," P. C. Morrison - "Geographic Aspects of Resource Utilization and of Settlement in Hokkaido, Japan," and A. K. Philbrick - "Field Study of the Gross Land Use and Economic Areal Organization of 18 Counties of Northwestern Lower Peninsular Michigan."

Current enrollment of graduate students includes 15 Master's and 9 Ph.D. candidates and there are 20 undergraduate majors.

University of Illinois, Chicago

In September Alden Cutshall returned from 15 months in eastern and southeastern Asia, primarily as Fulbright lecturer at the University of the Philippines and in continuation of research that was begun in 1950-51. Extracurricular activities included two lectures for the Armed Forces Institute of the Philippines, a lecture-seminar for department heads of the Philippine National Economic Council, and a lecture, "Philippine Industrialization," for the USIS lecture series in Manila. Last January he was elected a director of the Philippine Geographical Society and in March was appointed editorial consultant for the Philippine Geographical Journal. The past summer he spent 2½ months in travel and observation, principally on Mainland Southeast Asia, and lectured before the Geographical Society of Pakistan. While in the Orient Dr. Cutshall participated in a number of international and regional conferences; IGU Regional Conference in Japan, Ninth Pacific Science Congress in Thailand, First Southeast Asia Soils Conference in Manila, and Second Silliman Southeast Asia Conference at Dumaguete City. At the University of Illinois, he is currently Secretary of the Chicago Undergraduate Division Senate and Chairman of the Senate Committee on Educational Policy.

George A. Rheumer taught the past summer at Victoria College, an affiliate of the University of British Columbia. Next summer he will teach at the University of British Columbia in Vancouver. Mary McRae Colby received her doctorate from the University of Chicago in June 1958 and has been promoted to Assistant Professor. She continues on the Board of Directors of the Chicago Geographical Society and was recently elected

Secretary of the Society. Mildred Finney continues her activities in the Illinois Geographical Society, having been elected Secretary for 1955-56, President for 1956-57, and editor of the Society's Bulletin for 1957-58. Under her leadership a midwinter meeting was inaugurated and joint meetings with the Illinois Council of the Social Studies were strengthened. Gilbert Hunter of Clark University was a member of the department during the 1957-58 school year. Herbert Slutsky, a doctoral candidate at the University of Illinois, Urbana, taught at the Chicago Undergraduate Division during the 1958 summer session.

University of Wisconsin

In September 1958 Andrew H. Clark became the elected chairman of the department, and Arthur H. Robinson was put in charge of placement work. The first semester began with 36 graduate students in residence; 12 of these are from foreign areas. There are also about 20 undergraduate majors. In addition, Visiting Professor John A. Morrison of Quincy, Illinois is present for the first semester to offer work on the Soviet Union and to teach the elementary economic geography class. During the first and second semesters John W. Alexander is on leave at the University of California at Los Angeles. During the second semester the staff will be augmented by Visiting Lecturer Gunnar Alexandersson from the staff of the Department of Geography at the Stockholm School of Economics in Sweden. Mr. Alexandersson will offer courses on urban and manufacturing geography.

The Geography Club, under the leadership of Roy Merrens, has continued to provide opportunities for its members to hear talks given by guest speakers. During the first semester the guests and their topics were: K. B. Cumberland of Auckland University in New Zealand speaking on Samoa, Marvin W. Mikesell of the University of Chicago and Glenn T. Trewartha of this department who lectured on African topics, and Paul A. Siple of the U. S. Army and Vice President of the Association who described Antarctic research. The Club's Annual Fall Picnic revealed some remarkable softball techniques among the staff; however, the agile fielding of Richard Hartshorne, the power hitting of staff members' children, and the publicity campaign of Clarence W. Olmstead did not save the staff from defeat by the student members of the Club.

The department has instituted a revised program of work leading to the Master's Degree as a result of considerable study and discussion last year. The new requirements have been duplicated and are available for distribution. During the present year the program for the Ph.D. is being restudied to determine if revision is advisable.

The remodeling of Science Hall, a result of the departure of the Anatomy Department for new quarters, proceeds slowly. Geography, geology, meteorology, and the State Geological Survey reapportioned space in the building but the relief from crowded conditions is quite temporary. The staff office situation has been improved to help the research and teaching

program but it will be probably another year before laboratories will be shifted, the Map and Air Photo Library expanded, the University Cartographic Laboratory set up in new quarters, a new large lecture room created, and graduate assistants' offices changed and enlarged.

Eastern Michigan College

The eight full-time members of the Geography Department of Eastern Michigan College are reappraising and overhauling their freshman courses, with a view toward increased efficiency by utilizing members' special fields and interests more fully. Four members attended the National Council for Geographic Education meetings in New York at Thanksgiving time. The department is to be the host of the NCGE meeting in November 1959. The convention will be held at the Sheraton-Cadillac Hotel in Detroit. The entire department, now headed by Albert W. Brown (formerly of Eastern Illinois University, Charleston), is looking forward to increased departmental activities in terms of professional research and writing, student conferences, field trips, and in geography club programs. Geography majors number 43; minors number over 150. The total geography enrollment this fall is 1,258 students. Dr. Brown is active in Gamma Theta Upsilon and is treasurer of the National GTU Loan Fund.

Five members of the department are at various stages of advancement (chiefly on dissertations) toward their doctorates: Herbert Zobel at Northwestern University; Byron Emery, Bill Kneller, and Bud Sinclair at the University of Michigan; and Jim Gallagher at the University of Illinois.

James Glasgow, department head from 1939 to 1956, is now dean of the rapidly growing graduate division of the college; he teaches an occasional geography course and retains the title of Professor of Geography. Margaret Sill was acting head of the department from 1956 to 1958. She and Herb Zobel collaborated with others in the publication of Geography for the High Schools of Michigan, which is edited by Ross Pearson of the University of Michigan Geography Department.

Al Brown and George De Long attended the AAG meetings in Santa Monica, where the latter gave a paper on changes of temperatures in Northeastern United States from 1906 to 1955. The new textbook, Weather and Climate, co-authored by George De Long and Clarence Koeppe is now published (McGraw-Hill).

The department is anticipating new quarters eventually in a proposed wing of the new Strong Science Building.

University of Kansas

The Rose Morgan Distinguished Professorship in the University of Kansas is held this year by a Geographer - Norman Pounds of Indiana University. This distinguished professorship is awarded annually to a scholar of distinction in the United States. Dr. Pounds is giving courses and

seminars in political geography, historical geography, and Europe. His book on the upper Silesian industrial region will be published in January.

Walter Kollmorgen and George Jenks published two studies on sidewalk and suitcase farming. Several additional studies will be forthcoming to conclude this series. Jenks also built a vertical cartographic lucida which may be used to enlarge and reduce six-fold. He has completed his research on a systematic method for the selection of shading patterns on maps and graphs, and the results will be published shortly. He is now carrying on further research on three-dimensional cartographic techniques.

T. R. Smith and George Jenks have two new wall maps in the press, and Smith has commenced studies on livestock marketing in the Kansas City Trade area. A. W. Kuchler continues his research for a new vegetation map of the United States. He attended the 9th Pacific Science Congress in Bangkok, where he participated in a symposium, and made field studies in central and northern Thailand. He also visited India and lectured at the University of Delhi and at the Forest Research Institute at Dehra Dun.

D. S. Simonett is completing studies on clay mineralogy, weathering and soil genesis on basalts in North Queensland, and on grading relationships and soil-building and denudation phases of dunes in Western Kansas. Further studies on the role of loess in soil formation in Eastern Kansas, are under way. D. S. Knox works both for the department and for Community Studies Inc. of Kansas City. His research has been mostly on three-dimensional population models, economic base studies and census tracting in Kansas City.

The department currently has 20 graduate students in residence, about one third working on Ph.D's. Our foreign-student contingent numbers six, including three Fulbright Grantees.

LETTERS . . . . .

Dear Editor:

During last summer's field season it was my good fortune to work with many of our Scandinavian colleagues. Invariably an early topic of conversation was the IGU meetings to be held in Scandinavia in August 1960. These discussions often made clear the great pleasure our colleagues have in anticipating geographers from the United States, as well as from elsewhere. Even more clear was the great expense of time and energy being put into the planning, work made a bit more difficult than usual because five countries are involved in sponsorship and because the meetings will be held during the main part of the tourist season. Yet, they are working harder every month on the details of each session.

For some of the sessions and excursions lists of those proposing to participate were available. Representation from the U. S. and Canada on most of the lists seen ranged from none to a very few. It was obvious

later that this lack of indication of interest is complicating the planni for the meetings although our friends are too polite to say so. Of cours there are many reasons for lack of American registration. Perhaps o was the overlooking of the notice which you printed in May 1958 issue The Professional Geographer (p. 40). For those who did not see that, a for others who have any intention and possibility of attending, it is urg that they register now. Registration applications may be obtained fro the U.S.A. National Committee, IGU, NAS-NRC, 2101 Constitution Ave. Washington 25, D. C. Registration will clarify the extent of interest f the planners and perhaps will make possible continued planning for mee ings that otherwise might be thought so unattractive as to be canceled.

Attention might also be called to relatively inexpensive transportati to these meetings. It is Icelandic Airlines (Loftleidhir) and the vario university student administration charter flight groups. Many traveler agents will not call these to your attention but our family has used each round-trip flights and recommends them. Further, if Icelandic Airlin is used, the stop-over privilege may be employed, thus making possib the rare opportunity to participate in the Icelandic excursion. Iceland goes on eastward from Reykjavik to Oslo but commercial service is avai able on schedule between Reykjavik and the British Isles as well.

Perhaps our planning and registration for the 1960 IGU meetings mig be implemented by further action. Would it not be useful for us to paral the present action in Scandinavia with preparations now for a spec Scandinavian session at the Association's 1960 meetings? Such a sessio would honor the international meetings as well as help prepare those A merican geographers planning to attend.

Kirk H. Stone
University of Wisconsi

Dear Editor:

I regularly receive a publication entitled Arab News and Views fro the Arab Information Center, 120 East 56th St., New York City, an offic maintained by the Arab League. The October 23, 1958 issue has a rath interesting item, which reads as follows. "Algeria and its liberation wi complete the link between the Arab West and the Arab East, and thus t Arab League will extend from the Atlantic Ocean to the Arabian /sic/ Gulf... ." (Persian Gulf).

My curiosity was aroused as I had never heard or seen this usag Was this an expression of recent Arab nationalism? - or has this ter been used by Arab intellectuals for some time? This morning I called t editorial offices of Arab News and Views. A secretary there assured m that it was not a misprint and that the term was in current use. S referred me to a Mr. Babaa, a researcher at the information cente Mr. Babaa said that the Iraqi government, about one month after the revo lution last summer, had officially changed the name. He mentioned al that the other day he was reading an article by a westerner in a weste publication, and came across this term. Mr. Babaa suggested that I ca

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Dr. Bahi Hefny, an Egyptian geographer employed in the cartographic unit of the United Nations Secretariat. Dr. Hefny confirmed the above information, but stated as his opinion that it was not a mere expression of recent Arab nationalism since Arab geographers in past centuries had used the term. He did not believe, however, that many Arabs in this century had used this terminology.

Richard O. Riess
Teachers College, Columbia University

Dear Editor:

The suggestion of Yi-Fu Tuan in the November issue of The Professional Geographer that geographers might well have an interest in books on landscape painting, prompts me to carry the idea a step further. I am an artist and became also a geographer because my fascination with the appearance of the earth, especially as seen from the air, led me to learn more about it.

My special interest is the representation of natural appearance on relief maps. This interest was given tremendous impetus by the map paintings of Richard Edes Harrison. His concern for esthetics in cartography was amplified in an article in Harpers Magazine, July 1958. I found further a stimulation in the work and writings of Ed Imhof and more recently the suberb paintings of Hal Shelton, who brings this approach close to perfection for two-dimensional purposes. After many years of painting pictures of the earth as seen from the air, I was thrilled to have the opportunity to supervise both the construction and now the painting of the six foot Geo-Physical Relief Globe to represent the earth as it would appear from space.

I have great enthusiasm for the future of this natural color approach and am sure that observation of nature's appearance as a painter sees it would help any geographer's appreciation of his subject. However, I am the first to admit that natural representation has limited application in cartography and my chief purpose in writing this letter is to urge more concern for esthetic taste in map production generally.

Early maps were essentially pictures done by artists and many of them are truly beautiful - witness their increasing use for decoration. The increasing demand for scientific accuracy in maps, furthered by development of technical means for making them so, plus the commercial need for a profit, seems to have been accompanied unfortunately by considerable loss in their appearance - and often their effectiveness.

Robert Henri, one of America's great artists and teachers, defined art as "doing something - anything - well," and doing a map well calls for as much discrimination and taste as accuracy.

Kenneth S. Fagg
Geo-Physical Maps, Inc.

PERSONAL NEWS

Edward B. Espenshade, Jr., chairman of the Department of Geography at Northwestern University, has been appointed Chairman-Designate of the Earth Sciences Division of the National Academy of Sciences-National Research Council. He will become Chairman of the Division in July 1960.

Esther S. Anderson is now on the staff of the Census Bureau in Washington, D. C.

C. Warren Thornthwaite, Director of the Laboratory of Climatology, is to be presented with the American Geographical Society's Cullum Geographical Medal in recognition of his outstanding contributions to geographical science.

Paul Wheatley, Head of the Department of Geography at the University of Malaya, and editor of the Journal of Tropical Geography, is Visiting Professor at University of California, Berkeley, during the 1958-59 academic year.

Howard J. Critchfield, Western Washington College of Education, will be Visiting Lecturer at the University of Canterbury, Christchurch, New Zealand.

William A. Rockie will soon return from Denmark where he has been conducting joint soil conservations studies with Professors Humlum and Mogensen of the Geographic Institute of the University of Aarhus.

Norman Carls has resigned the chairmanship of the Department of Geography at the University of Pittsburgh to devote a two-year leave of absence to writing elementary textbooks.

Joseph E. Spencer of UCLA has returned from a year as Fulbright Lecturer at the University of Malaya. He spent time in the Philippines on his way to Singapore, and also visited Ceylon, India, Burma, and Northern Malaya.

Harry P. Bailey, UCLA, has received a Guggenheim Fellowship for 1958-59 to study climates of areas formerly glaciated. He will visit the Laurentide and Baltic areas as well as other parts of Europe, North America, and New Zealand.

Ruth E. Baugh, Emeritus Professor of Geography from UCLA, is Visiting Professor at the University of Nebraska for the academic year 1958-59.

J. Slaten Jenner, formerly with the Office of Area Development, has been named manager of the Economics Division of Midwest Research Institute.

Chiao-Min Hsieh, Catholic University, has received an award of $1,500 from The Evening Star (newspaper) Research Fund to complete his work on a comprehensive geography of Formosa.

NEW PUBLICATIONS

The Climate Near the Ground. Rudolf Geiger. Translation by Milroy N. Steward and others of the Second German Edition of Das Klima der Bodennahen Luftschicht with revisions and enlargements by the author. Second printing, revised. Published for Blue Hill Meteorological Observatory by Harvard University Press. 1957. 494 pp. $6.00.

From its first appearance, in 1927, Rudolf Geiger's work, Das Klima der Bodennahen Luftschicht, has unified microclimatologic investigations that have converged from forestry, agronomy, hydrology and other fields; it has stimulated research by practicing land-management men, and has provided a sense of direction to what otherwise might have been random, tangential projects.

Many of these practitioners do not use German, and several translations for organizational use have been made here and abroad, that by Leighly in 1937 being perhaps best known. The second German edition, in 1942, was translated after the war into English, and with revisions based on the third German edition (1950), has gone into almost every group in the country that is responsible for problems of the land. The second printing of this translation has now appeared, differing from the exhausted first printing chiefly in a supplemental bibliography that adds about 80% to the references of the first printing.

The text of the new printing is based on the older bibliography and has not incorporated much recent material. Thirty per cent of the citations are from the 1920's or earlier, and 60% from the 1930's. They are strongly central European in origin -- half come from Germany, a fifth from Austria and Switzerland together, somewhat fewer from Scandinavia; nine-tenths are in the German language. The supplementary bibliography reflects changes in microclimatology since the war, due to some extent to Geiger's influence. Forty per cent of the papers are in English, including those from Japanese, Indian and Scandinavian sources. There are few Russian papers. The United States account for a fifth of the items, as do Austria and Switzerland together, and England and Scandinavia together. Germany remains the chief contributor, though not in the primary position it had in the old bibliography and in the text. As the influence of the English translations continues, English-speaking countries will no doubt increase their contribution.

Although Geiger's own major work is in forest climatology, this aspect occupies only 12% of the book, which takes a comprehensive view of the field. There are 7 sections, with 41 chapters: (1) heat exchange near the ground, fundamental to processes on a regional scale as well as a micro-scale; (2) temperature relationships near the ground; (3) humidity and other relationships -- relationships are emphasized throughout the book; (4) influence of the ground as such -- soil condition, surfaces of

water, snow or sod. These four sections present the uncomplicated case of microclimatic distributions, in which the vertical profile is the major means of study. The second half of the book extends this simple case to situations in which (5) the influence of topography, and (6) the influence of plant cover, are important, and the final section (7) discusses relations of animals and man to microclimate. Thus the major landscape components are taken in succession: surface character, slopes, vegetation types, and such artifacts as cities and such modifications of climate as orchard heating.

Geiger points out that the cry from geographers for more climatic stations may often be met by using these relationships to extend the 'range of validity' of existing stations, in the light of the regimes of radiation and wind that produce climatic characteristics. All through the book is an emphasis on regime -- diurnal and annual -- that is peculiarly climatologic. In association with this is a treatment of spatial distributions that is geographic in aspect; the whole is illuminated by frequent recourse to the causes of these distributions -- a 'quantitative apprehension' of the heat economy of the ground surface. Each page of text has, on the average, three citations and one figure, the latter usually of great detail and clarity, often ingeniously presenting complex relationships.

In spite of age of the papers on which much of the text is based, and minor translation errors, this book is recommended to geographers whether they are interested primarily in physical processes in the landscape, in its commercial potentialities, or its areal differentiation. It will open to them a vast field of research and practice in landscape relationships that can add greatly to their own studies. Although announcement of a fourth German edition is expected, this translation, with its large bibliography and clear presentation of a field the author has helped to develop, will be valuable to many active research men working in its diverse approaches.

---David H. Miller

Deutscher Planungsatlas: Atlas von Berlin. Issued by the Academy for Area Investigation and Land Planning and by Prof. Dr. W. Behrmann by Commission of the Senate of Berlin.

The attention of geographers interested in the Berlin area is directed to the Deutscher Planungsatlas: Atlas von Berlin. This atlas, which now includes 28 sheets, will be enlarged in the next few years to include a total of 100 sheets. Cartography and printing are the responsibility of Lindemann & Ludecke of Berlin, and the cartographic work is under the direction of K. S. Kuhn, A. Bury, and F. Holzel.

All maps are in color and are on sheets measuring 24" by $16\frac{3}{4}$". Cost of individual map sheets is 3 West German Marks (approximately 73 cents). In many cases, the map sheet is subdivided into several maps dealing with one topic, in others, insets are employed. The sheets issued to date include maps of altitude and depth, relief, subdiluvial relief, pre- and early historical colonization, urban development, field and village formations about 1800, decrease and increase of population for Berlin and surround-

ings 1890-1946, population development 1910-1950, population (density), religions 1953; navigable waterways, water organization and fishing in the Berlin locality; water supply, waste water removal, and utilization; employees in the most important industrial groups according to their places of work, commuting in typical city areas 1950, commuter trips to the siemens works 1955, city traffic 1953, railroad traffic, receipt of agricultural produce 1938, receipt of coal 1938, total receipt of goods 1938, total export of goods 1938, war damage, structure of Berlin, large scale comparisons of the Berlin land with German areas 1953, migration, Berlin city traffic 1937 and 1958, and examples of old village settlements and field patterns.

---Jack R. Villmow

The Exploration of Time. R. N. C. Bowen. Philosophical Library. New York. 1958. v and 143 pp. illust. $6.00.

The Exploration of Time appears at a most crucial moment in the development of the historical sciences. Almost boldly, this succinct treatise cautions us that it is not always possible to determine age by atomic methods; that the establishment of relative chronologies is still important. It is with the techniques and methods of indirect dating that the book is concerned.

An initial section of 3 chapters discusses the earth as a planet, the science of dating, and the nature of time. This is followed by 10 chapters in which are outlined the various scientific contributions during the past 75 years to the field of geochronology. Methods treated include: physical and chemical, astrophysical and astronomical, botanical, zoological, geological, geographical, archaeological, anthropological, and meteorological. A final section of 2 chapters deals with new ideas and the revolution in thought that have occurred as a result of geochronological work.

The author is to be lauded for his brevity in discussing the means of indirect dating, but one wonders if it is necessary to devote almost a quarter of the book to Chapter I, "The Earth as a Planet." A lengthy restatement of the well-known eras in the earth's history seems out of place in an otherwise concise work. Further, such contraversial subjects as the aeolian origin of loess, continental drift, and equatorial shifts (as an explanation for the occurrence of laterite) are handled as if they were proven and unarguable.

Geographers will not take readily to the author's notion of what constitutes the geographical method of age determination, namely, the origin of granite. Certainly, subjects such as continental drift, soils, glaciers, human migrations, ancient homes of man, and most of the meteorological methods cited seem nearer to geography than the development of one rock-type.

The book is primarily a handbook, crammed with essentials, and containing numerous line drawings, charts, graphs, and tables, though it lacks a bibliography. It fills a definite need in that it attempts to organize all of the current theories pertaining to age determination, and it reemphasizes the importance of relative dating methods. Anyone interested in the earth will find this little book a valuable addition to his library.

---Robert Fuson

Caribbean Area. Clarence F. Jones, ed. Denoyer-Geppert Co. Chicago. 1958. Scale 1:2,200,000. 64 x 44 inches. $13.50-22.00 according to mounting selected.

This layer map, made more graphic by the use of shaded relief, portrays the area from Yucatan to the Lesser Antilles and from Miami to the Orinoco. The scale is large enough so that the principal islands of the Lesser Antilles can be distinguished from the back of the classroom. Country names and boundaries, major relief features and ocean depths, sea routes and major highways, are clearly shown but the railroad lines, shown in great detail, are much less visible. Legends and names are in both Spanish and English - a commendable feature which in a few areas may be confusing because the Spanish version, e.g., Puerto Principe, is in larger type than the locally-used name, Port au Prince. Insets of Puerto Rico and the Canal Zone on a scale of 1:375,000 add to the value of this attractive wall map.

---Otis P. Starkey

A Study of Desert Surface Conditions. Thomas Clements, R. H. Merriam, R. O. Stone, J. L. Eymann, and H. L. Reade. Technical Report EP-53. Environmental Protection Research Division. U. S. Army, Quartermaster Research & Development Center. Natick, Mass. April 1957. vi and 111 pp. illust. Free but supply limited.

As a result of field work in the desert regions of southwestern United States, a classification of desert surface types was developed. Each of the 10 recognized types (playas, desert flats, bedrock fields, regions bordering through-flowing streams, alluvial fans and bajadas, dunes, dry washes, badlands, volcanic cones and fields, and desert mountains) is described in varying degrees of detail with regard to distribution, origin, general topography and surface features, surface materials and trafficability, vegetation, and surface color. This descriptive section occupies the bulk of the report and is accompanied by a fold-in map of the actual distribution of these types and their subtypes in southwestern U. S. In addition, there is a very brief guide to the map identification of these types, and two tables showing the areal extent of the desert types in the U. S. and in comparison with the Sahara, Libyan Desert and Arabian Desert. A brief bibliography of 47 entries is included.

Climatic Analogs of Fort Greely, Alaska, and Fort Churchill, Canada, in Eurasia. Sigmund J. Falkowski. Technical Report EP-77. Environmental Protection Research Division. U. S. Army, Quartermaster Research & Engineering Center. Natick, Mass. December 1957. iv and 37 pp. illust. Free but supply limited.

On the basis of selected climatic elements, similarities are determined between the climates of the two Army cold-weather test sites and those of the arctic and subarctic areas of Eurasia north of 45° N. Information on the climatic elements is given in text and tables. The results of the study are also presented on maps of Eurasia which show the analo-

gous areas for each of the following elements: mean temperature of the coldest month, mean daily minimum temperature of coldest month, absolute minimum, mean windchill of coldest month, mean cloudiness of coldest month, mean snow depth in month of greatest depth, mean temperature of warmest month, mean daily maximum temperature of warmest month, mean cloudiness of warmest month, mean annual precipitation, mean number of days with fog, and a composite of all these elements.

Atlas of Mountain Glaciers in the Northern Hemisphere. W. O. Field and Associates. Technical Report EP-92. Environmental Protection Research Division. Quartermaster Research & Engineering Center. Natick, Mass. June 1958. vi and 48 pp. 8½ x 11 inches. Free but supply limited.

The atlas is divided into five parts to show the distribution and details of Northern Hemisphere mountain glaciers in North America, North Atlantic Islands, Europe, Asia and adjacent parts of the U.S.S.R., and Africa. The degree of detail in which the glaciers are shown depends upon the availability and reliability of source material, thus those of North America and Europe receive the most extensive treatment. Each map indicates the source maps used in its compilation, and most of the maps of North America have a reliability index. The maps were drawn by the Cartographic staff of the American Geographical Society, and reflect their usual high standards. This atlas, although published separately, is part of an extensive study of mountain glaciation conducted under a Quartermaster contract by William O. Field, head of the AGS Department of Exploration and Field Research.

A Method for Assessing and Mapping the January Daily Minimum Temperatures of Northern North America. Earl E. Lackey. Technical Report EP-88. Environmental Protection Research Division. Quartermaster Research & Engineering Center. Natick, Mass. May 1958. iv and 32 pp. Free but supply limited.

The report describes a graphic method for determining the frequency or percentage distribution of daily minimum temperatures for a station by using commonly available data, that is, the mean daily minimum, the absolute minimum and the length of record, in conjunction with an adjusted probability scale. The construction, adjustment and testing of the scale are described and illustrated. The method was used to estimate the daily minimum probabilities for 71 stations, the results are presented in tables and five maps.

Essentials of College Geography. C. Langdon White, George T. Renner and Robert T. Novak. Appleton-Century-Crofts, Inc. New York. 1958. viii and 580 pp. illust. $6.00.

This is a condensed version of College Geography designed for a one-semester course. The reduction was achieved mainly by deletion of all but "those facts which are considered essential to a better comprehension of the principles of geography." Unchanged is the general approach to the

subject, namely, the human ecology school of geography. This is because the authors believe that "one of the greatest needs of American students today is to be taught to view themselves and all other peoples of the world in the light of their specific homelands and to be led to understand people's problems and their solutions of these problems in terms of the kind of places where these problems arise." Thus, 70 per cent of the book is devoted to discussion of the inhabitants, their activities, and the physical environment in each of eleven climatic regions and four topographic habitats. The availability and uses of various resources are then described. The book ends with a chapter on globes and maps, and a survey of problems of population distribution and growth. There are numerous fine pictures and maps.

Economic and Social Geography. Sidney E. Ekblaw and Donald J. D. Mulkerne. Gregg Publishing Div., McGraw-Hill Book Co., Inc. New York. 1958. 415 pp. illust. $4.56.

This is a successor to Influence of Geography on Our Economic Life, a text familiar to school teachers. It is divided into six parts. The first outlines the physical environment, and the next four are concerned with how man lives, works, and uses resources in the tropics, subtropics, middle latitudes, and high latitudes. The last part is a brief over-all view of resources, trade and economic relations. Nine pages of colored maps provide a useful atlas, and seem to take the place of maps in the text. Pictures are plentiful.

Land, 1958 Yearbook of Agriculture. United States Department of Agriculture. Government Printing Office. Washington, D. C. 1958. xlix and 605 pp. illust. $2.25.

In the introduction to Land, Secretary of Agriculture Ezra T. Benson points out that although science has ushered in the Atomic and Space Age and man has launched satellites with a degree of confidence on reaching the moon, we Americans still live close to the land. Many of us make our living from it. Many others derive pleasure from the recreation that forests, fields, and streams afford. For each of us the land provides living space and is the source of our food, clothing and housing. With these concepts in mind, the 1958 Yearbook Committee detailed some fifty agriculturists, foresters, economists and geographers to prepare a manuscript which treats the land as it was when the colonists came, its importance in our history and growth, the use and management of public and private holdings, income and valuation of land, resources and prospective needs, and the emerging problems of ownership and control.

Along with earlier yearbooks concerning Climate and Man and Soils and Men, Land is ideally suited for courses in economic, historical, and agricultural geography, land utilization and conservation of natural resources, and will be welcomed by college professors and researchers as well as the general public. Readers should not despair when they find chapters which are at variance with one another because the authors were given no orders on what to write or what policies to advocate or denounce.

As a result, thought provoking views and opinions are expressed and pursued. The volume contains 84 photographs, numerous sketches, charts, and graphs, and a complete index.

---J. L. Taylor

GeoSurveys. H. A. Meyerhoff and G. M. Keener. 1417 K St., N.W., Washington 5, D. C.

GeoSurveys is a two-page weekly by Howard A. Meyerhoff, long a member of the AAG, and Gladys M. Keener, who was executive editor of Science and the Scientific Monthly during the decade when Dr. Meyerhoff was executive or administrative secretary of the American Association for the Advancement of Science. Each issue contains an excellent summary of a significant topic in the resource field. In general, each month there is one bulletin devoted to a country in Latin America or a resource topic in Latin America, one on a metal, one on an energy resource, and one on a non-metal resource. Since it was decided in mid-1958 to accept subscriptions, numerous geographers and others have profited from the authentic current information which these weekly issues contain. They reflect Dr. Meyerhoff's broad interest and long experience in the tropics, and in economic geography and geology.

The subscription price to teachers, libraries and college departments is $5.00 a year.

---Stephen S. Visher

Geographic Impact of Highway Improvement. William L. Garrison and Marion E. Marts. Highway Economic Studies. Dept. of Geography and Dept. of Civil Engineering, University of Washington. 1958. xi and 139 pp.

Marysville, Washington, is a small coastal town on U. S. Highway 99. In the fall of 1954, the town was bypassed by a divided four-lane, limited-access road. What has happened in Marysville as a result of this highway re-alignment provides the basis for this study. A thorough look is taken at the changes in transportation, land use, and business which have resulted from the opening of the new highway.

The writers have integrated their research results into a well organized report. Chapter I presents a brief overview to the area and the method of approach to the research project. The three principal chapters deal with traffic and accessibility, variations in business conditions, and the impact on land values. A concise evaluation summarizes each chapter. An impressive selection of tables and graphs complement the textual material and statistical data are freely utilized to support analytical statements. An appendix contains additional graphics to supplement the body of the study. There are four excellent aerial photos of Marysville and its environs.

There is much to be gained from this study. It affords the reader an insight into relationships between highways and communities, and provides a clearer understanding of the impact of highway improvements upon towns, such as Marysville. The method of approach, techniques of research,

and organization of the study will be of interest to many researchers.

---Robert E. Gensler

The Pacific Lowlands of Colombia. Robert C. West. Louisiana State University Press. Baton Rouge. 1957. xiv and 278 pp. illust.

This volume, number eight in L.S.U.'s Social Science Series, represents an important contribution to the world's knowledge of tropical geography. The subject area of Dr. West's study is a 600-mile-long strip of the northwestern South American coast, extending from southern Panama along the entire Pacific llanura of Colombia to Esmeraldas Province, Ecuador. Although Europeans have exploited the mineral and forest wealth of this area for three centuries, its forbidding climate has kept scientific knowledge of most of the region to a minimum. The author spent the summers of 1951 through 1954 in the region and has come forth with a thorough, well-written study which goes far toward filling this void.

The volume's strongest section is undoubtedly its encyclopedic treatment of the area's physical characteristics. Particularly impressive is the discussion of the vegetational types and growth patterns of the area. For example, Dr. West makes an interesting comparison of mangrove distribution along the Colombian littoral with similarly forested regions of Asia. The use of maps and photographs is frequent and effective and supplements the text well. In the final two chapters of the book the area's population and economy are examined in detail. As a study of the development of a negroid culture under Hispanic influence and of man's adaptation to a climate with precipitation surpassing 400 inches in places, the economic chapter is particularly fascinating.

For anyone interested in tropical geography - either its physical or human aspects - Dr. West's study is highly recommended.

---Donald J. Lloyd-Jones

Franklin D. Roosevelt and Conservation, 1911-1945, compiled and edited by Edgar B. Nixon. Franklin D. Roosevelt Library,* Hyde Park, New York. 1957. 2 vols. xiv and 614 pp. and 700 pp. $9.50.

The Franklin D. Roosevelt Library at Hyde Park, New York, houses a veritable mine of material. FDR had a deep and abiding interest in conservation and exercised on developments in this field a direct and decisive influence. The nature and background of his interest and actions, as well as those of others who proposed, supported or opposed specific measures, are illuminated by the memoranda, letters, and reports here printed.

From the great range and volume of material in the Library there has been selected for publication in these volumes about a third of the papers relating to conservation of renewable resources other than waterpower, thus opening this part of the mine to the general public instead of to only

*The Library is administratively under the National Archives and Records Service, which in turn is a part of the General Services Administration of the United States Government.

the few who could spend the time and money to dig for themselves at the Library. Reference is made to many papers not included in the volumes. The calendar of all pertinent documents and the documents themselves may be examined at the Library or obtained on microfilm.

Volume I covers 1911 to 1937, the period beginning with FDR's service in the Senate of New York through his first term in the Presidency. Volume II covers the second, third, and fourth terms.

The brief editorial notes following many of the papers are invaluable. They identify persons, actions, dates, drafters, etc., when the paper does not, or state concisely what happened as a result of the paper. The fifty-page double-columned index is reasonably adequate.

The editor and compiler states in an Introduction that the papers selected include "all of what appear to be the basic and significant materials except certain kinds of formal documents such as laws and executive orders .... readily available elsewhere."

---Meredith F. Burrill

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JAN 59

SOCIAL STUDIES

EVELYN L. PRUITT, Editor

Volume XI JANUARY 1959 Number 1 - Part II

STATUS AND TRENDS OF GEOGRAPHY IN THE UNITED STATES 1952 - 1957

A Report Prepared for the Commission on Geography
Pan American Institute of Geography and History

By
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Pan American Institute of Geography and History
June 1958

Edited by
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Clarence F. Jones, Professor of Geography, Northwestern University and United States National Member of the Commission on Geography, PAIGH.
Robert H. Randall, Bureau of the Budget, Executive Office of the President, Washington; Acting Chairman, Commission on Cartography; and Chairman, U. S. National Section, PAIGH.

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STATUS AND TRENDS OF GEOGRAPHY IN THE UNITED STATES 1952-1957

This report deals with the status and trends of geography in academic institutions, government, business, and professional societies in the United States of America. Between 1952 and 1957 geographic activities increased greatly not only in colleges and universities, but also in government, business and professional societies. Although the number of trained geographers turned out by universities has increased considerably, the supply each year has fallen far short of meeting demands in academic institutions, government, and business organizations.

PART I GEOGRAPHY IN ACADEMIC INSTITUTIONS

Nearly all aspects of geographic activities in academic institutions increased significantly between 1952 and 1957: total enrollments in courses in geography and in courses in the major divisions of the discipline, schools offering work in geography, schools having departments of geography, full-time geography instructors, full-time instructors with the doctorate, schools offering graduate work, and the scope of research of doctoral dissertations.

Enrollments

Total Enrollments

The total enrollments in geography courses in the United States increased from 231,770 in 1952 to 274,130 in 1957 (Table I), or an increase of more than 18 per cent. A majority of the states shared in this increase. The ten states (California, Ohio, Pennsylvania, Michigan, Illinois, New York, North Carolina, Wisconsin, Tennessee, and Minnesota) each with more than 9,400 enrollments in 1957 had 51 per cent of the enrollments in geography in the United States; the same states in 1952 had 50 per cent. If the above rate of increase is maintained, which at the moment seems very likely, the enrollment in geography courses in colleges and universities in the United States in 1962 will be close to 330,000. It could be considerably larger. The rate of increase in enrollments in geography courses has been somewhat higher than the total enrollment in undergraduate and graduate courses. For the years to come a much larger number than at present of students attending colleges and universities has been projected by many authorities. The overall interest of several segments of our population in what geography has to offer is much more likely to increase, rather than to remain static. It seems

Table I

Total Enrollments in Courses in Geography and in Some of the Major Divisions of the Discipline 1952 and 1957 (1)

Enrollments	1952	1957	Percentage Increase
Total	231,777	274,136	18.0
In schools with one course in Geography	14,979	20,595	37.0
In schools with two courses in Geography	14,994	23,486	56.0
In schools with more than two courses	201,804	229,055	13.4
In Introductory Courses	87,539	126,082(2)	44.0
In Economic Geography	54,028	56,776(3)	5.0
In Regional Geography	52,299	52,871(4)	1.0
In all other courses	37,911	38,407	1.3

(1) Figures taken or compiled from Directory of College Geography in the United States, Vol. V (1954), and Vol. IX (1958). Department of Geography, University of Kentucky, Lexington. These figures may not be complete in all respects, but they are the most complete figures available.

(2) Includes all introductory courses, such as Elements, Principles, Fundamentals, Human, Cultural, Global, and World (excluding World Regional), and elementary Economic Geography courses in schools giving only one course in Geography (see Table II).

(3) Includes Economic, Commercial, Business, Industrial, Resources, Transportation, and Conservation; does not include the elementary Economic Geography courses mentioned in above footnote (2).

(4) Includes World Regional, separate continents and major subdivisions of continents, and courses on individual states in the United States (see Table III).

most likely that enrollments in geography courses not only will keep pace with the growth of the college and university student population, but that they also will increase at a more rapid rate. Among others, at least two significant reasons for the growing interest in geography on the part of students and of the general public as well are the rapid change from an "isolationist" to an "international" point of view by more and more of our population and the rapidly increasing employment opportunities for trained geographers.

Following 1940 many events encouraged Americans to become more and more internationally minded. World War II took millions of young men from farm, village and city into far away and strange places, whence news of successes and tragedies came to millions more back home. It forcefully focussed our attention upon the aspirations of peoples about whom we really knew very little. Millions of service men first came into contact with academic geography in ROTC courses in many colleges and in especially arranged service courses;[1] others learned the geographic characteristics of widely scattered areas the hard way - by experience. Shortly after the outbreak of the war, the federal government recruited professional geographers in large numbers in the United States for intelligence and other work dealing with foreign areas. As of December 1944, some 293 civilian geographers were employed by the federal government agencies and an additional 265 in uniform were in government offices or in the field. "Government employment of geographers reached a peak in 1945 when perhaps 500 were on the payroll."[2] World War II, the creation of the Organization of the United Nations in 1945 and subsequently its many agencies, the Korean War and several little wars, the "Cold War" and the stupendous task of rebuilding war-ravaged areas all made most of the adult population of the United States realize that the United States, which had become the leading World Power, would have to play an ever-increasing role

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[1] "Wartime conditions led to an unprecedented demand for geography teachers to school military personnel in rudiments of systematic and regional geography" in various military training programs -- ASTP, USAAF, Civil Affairs, Navy V, etc. George F. Deasy, "Training, Professional Work and Military Experience of Geographers," The Professional Geographer, Vol. 6 (December, 1947), pp. 1-15, and E. Willard Miller, "Geography in the Army Specialized Training Programs," Bulletin of the American Society of Professional Geographers, Vol. 3 (May-July, 1945).

[2] George F. Deasy, "Wartime Changes in the Occupation of Geographers," The Professional Geographer, Vol. 7 (April, 1948), pp. 33-40.

in international affairs. The great improvements in transportation and communications made distant peoples relatively close neighbors. Military and other large foreign aid programs and increasing investment in foreign areas of private and government capital induced millions of United States citizens to live and work for extended periods in areas outside the United States. A high level of living in the United States and improved transportation made it possible for great numbers to travel and to spend millions of dollars each year in foreign countries. Generous foundation and government grants and international conferences gave students opportunities to visit and to study firsthand the geography of foreign countries. Newspaper features, magazine articles and books forcefully made known to all who would read the distressing geographical ignorance of large numbers of our people.[3] These developments and others brought to the attention of citizens of the United States the contributions that geography can make to the understanding of peoples of foreign areas and possibly to the maintenance of peace.

World War II also contributed greatly to the establishment of increasing employment opportunities for persons with geographic training. The professional geographers, who were engaged in strategic and tactical intelligence, cartography and in area and topical research and analysis, quickly demonstrated to government officials and the many business men also in war work in Washington geographers' capabilities. Prior to 1940 there was no Army Map Service, no Aeronautical Chart and Information Service.[4] Prior to the middle of the 1940's, outside of engineering there was no civil service classification that covered geography, but now many classifications, such as "Geographer", "Cartographer", "Cartographic Aid", etc., exist at several G. S. levels. At the end of the war, governmental and business administrators were receptive to the employment of geographers.

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3 Following are examples: (1) Benjamin Fine, "Geography Almost Ignored in Colleges Survey Shows," The New York Times, December 18, 1950, p. 1. Less than 5 per cent of college students take one course in geography -- based on survey of 298 institutions of higher learning in the United States. (2) Benjamin Fine, The New York Times, June 11, 1951, p. 1. Survey of 4,752 college students shows wide ignorance of geography according to Times test. (3) Otis W. Freeman, "Geography Offerings in Universities and Colleges of the United States," Higher Education, November 15, 1948, pp. 61-65. Based on survey of 1,015 catalogues. (4) Otis W. Freeman, "Status and Purpose of College Geography", Higher Education, October 1, 1958, pp. 31-55.

4 "Cartography" in Ten Eventful Years, Encyclopedia Brittanica, Inc., 1947, pp. 547-550.

Although many geographers, engaged in war work, returned to the academic field, many also continued and others joined them, in government work in the departments of State, Defense, Interior, Commerce and Agriculture and the independent offices of the Executive Branch. Others obtained lucrative jobs in town, city, metropolitan-area, river-development and other similar agencies. Still others entered employment in business, industry, and private research or planning establishments. Since the end of World War II, the requests each year for geographers in all of these areas and in the academic field as well exceed the supply.

Enrollments in Elementary Courses

Nearly 91 per cent of the increase in enrollments in geography courses between 1952 and 1957 took place in elementary courses. Enrollments in elementary courses increased by 44 per cent, in economic geography by 5 per cent, in separate continent (regional geography) courses as a group by 1 per cent, and in all other courses as a group by 1.3 per cent. Nearly every school, which offers work in geography (including most schools classed as primarily graduate schools), has one or more introductory courses. Enrollments in schools with only one course in geography, offered once or more than once in a year, increased by 37 per cent between 1952 and 1957; in those with two courses by 56 per cent; and in those with more than two courses by 13 per cent. In 1952 introductory courses accounted for nearly 38 per cent of all enrollments in geography; in 1957 about 46 per cent. As an average of thirty schools each year in this period added geography to their curricula and as introductory courses are generally the first ones added, enrollments in introductory courses naturally increased more rapidly than those in other aspects of geography.

In the United States introductory courses in geography are offered under a wide variety of titles -- Introductory Physical, World, Introduction to Geography, Principles of Geography, Elements of Geography, Human Geography, General Geography, Social and Cultural Geography, Fundamentals of Geography, Global Geography, Introductory Economic Geography, and Geography of Man (Table II).[5] Enrollments in all the above categories

[5] The listing of introductory courses in the two volumes of the Directory of College Geography in the United States may not be exactly comparable. In Volume V courses "are arbitrarily arranged as to level of offering". In Volume IX "all lower division courses are placed in column one and classed as introductory". However, detailed work with these statistics seems to indicate that the designation as introductory courses is relatively accurate.

increased between 1952 and 1957. Seven of the categories registered increases of from 64 to 99 per cent, whereas the other five had very small increases (see Table II). Of more interest and significance perhaps is the fact that the first two (Introductory Physical and World) accounted for nearly 26 per cent of the enrollments in all introductory courses in 1952 and nearly 32 per cent in 1957.

The high rank of introductory physical geography is due in part at least to the fact that in many colleges this course gives laboratory science credit not only for geography students but also for students in other disciplines. In 1957 in the United States twenty-eight classes, each with more than 250 students in physical geography, in as many schools had about 75 per cent of the total enrollment in introductory physical geography. It is known that in most of these schools and in many others as well, physical geography is granted laboratory science credit, even though administratively geography in many colleges may be in the social science division.[6] It is quite generally recognized that one basic segment of geography embraces a study of the variations from place to place on the earth's surface of the physical aspects -- landforms, climate, soil, water, vegetation, animals, and minerals.

Although one cannot be certain of the exact character of the courses in the other eleven categories of introductory courses, as listed in the Directory, it is safe to assume that all of them deal with the differences from place to place of the cultural and physical elements and the interrelations between their distributions. They may differ considerably in methods of approach and analysis and in emphasis, but they all are aimed at (1) giving the student some understanding of the modern world in which he lives and works, and (2) in many instances laying the foundation for additional work in geography.

Enrollments in Economic Geography Courses

Between 1952 and 1957 enrollments in courses in economic geography increased by 5 per cent (see Table I)[7]. In Table I the

6 In these twenty-eight schools geography as a department has a separate status in eleven; it is included in an earth science or physical science department in eight; in a combined department of geography and geology in five; and in a social science department in two; in two the status of geography is not indicated in the directory.

7 These do not include the economic geography courses, classed as introductory courses in schools which offered only one course in geography (see Table II).

Table II

Enrollment in Introductory Courses in Geography 1952 and 1957 (1)

Course Titles	1952 No. of Courses	1952 Enrollments	1952 Percentage of Total	1957 No. of Courses	1957 Enrollments	1957 Percentage of Total	Percentage Increase
Introductory Physical	96	12,395	14.2	173	12,895	17.4	76
World (2)	106	10,237	11.7	131	17,800	14.1	73
Introduction to Geography	72	9,331	10.7	101	17,682	14.0	89
Principles of Geography	149	12,914	14.8	169	15,055	12.0	16
Elements of Geography	81	13,168	15.0	95	14,123	11.2	7
Human Geography	103	10,931	12.5	115	13,651	10.8	23
General Geography	66	5,281	6.0	78	8,864	7.0	67
Social & Cultural Geography	40	2,542	2.9	64	5,067	4.0	99
Fundamentals of Geography	26	3,228	3.8	25	3,361	2.7	4
Global Geography	10	1,627	1.9	23	2,676	2.1	64
Intro. Economic Geography(3)	77	2,524	2.8	69	2,640	2.1	4
Geography of Man (4)	9	1,002	1.1	6	1,873	1.5	87
Title not specified	49	2,359	2.6	33	1,395	1.1	
	884	87,539		1,082	126,082		

(1) Compiled from Directory of College Geography in the United States, Vol. V (1954), pp. 6-90 and Vol. IX (1958), pp. 3-53. Department of Geography, University of Kentucky, Lexington.

(2) Does not include courses designated as World Regional Geography. Actually some of these courses may be World Regional Geography.

(3) The courses in Introductory Economic Geography included in this table are in schools which offer only one course in geography and are, therefore, considered to be introductory courses.

(4) Includes a few courses with the title "College Geography".

courses listed as economic geography include also courses with the titles of commercial, business, industrial, resources, and transportation geography, and in addition those of conservation. In 1952 nearly 24 per cent of the total enrollments in geography courses were in economic geography; in 1957 about 20 per cent. The rank of economic geography is explained in part by the facts that it (1) was one of the first aspects of the discipline to be developed in the United States, (2) is more generally offered than any other single course in the discipline, and (3) is in many schools a service course for students in other disciplines. In both the above years conservation accounted for not more than 16 per cent of the enrollments in economic geography. Conservation is essentially a specialty in itself and is here included with economic geography for convenience only.

There is a distinct tendency, particularly with respect to research, for the general field of economic geography to break into component specialties, such as agricultural geography, geography of manufacturing, land utilization, mineral geography, transportation geography, marketing geography, etc. Very few professional geographers now attempt to become specialists in all aspects of economic geography. It is to be expected that this trend will continue at an increasing rate. Nevertheless, the total course offerings in 1957 in all these separate specialties represented a small proportion of the courses in economic geography, even without counting those in conservation. In view of the large amount of research and publications by geographers in these special aspects of geography it is somewhat surprising that more specific courses on these subdivisions of economic geography have not been introduced into the curricula of many departments.[8] At present courses in general economic geography -- those which attempt to cover most of the aspects of this broad field -- commonly follow one of three methods of organization: straight commodity, regional, or occupational.

Enrollments in Regional Geography Courses

From 1952 and 1957 enrollments in regional geography courses increased by only one per cent. The term "region" is here used in the traditional sense, i. e., a major division of the earth's

8 For examples of these publications, see Preston E. James and Clarence F. Jones, (Editors), American Geography: Inventory and Prospect, published for The Association of American Geographers by the Syracuse University Press, 1954, pp. 256-7, 274-7, 289-90, 306-8, and 330-2.

surface.[9] Here a region refers to an area of continental size or a considerable portion of a continent, with the exception of the courses on individual states of the United States (Table III). In 1952 regional courses accounted for 22 per cent of the total enrollments in geography and in 1957 about 19 per cent.

Not counting courses dealing with world regions and individual states, somewhat more than 44 per cent of the enrollments in courses on major divisions of the world in both years were in those on Anglo-America. This is an indication of the importance that both students and teachers place on a knowledge of the home area. Most schools, which offer regional courses, give one on Anglo-America. In many schools it is the first regional course taken.

In enrollments in courses on major divisions of the world Latin America ranked second, with 17.5 per cent of those in this category (not counting courses in world regional and individual states) in 1952 and 16 per cent in 1957. Latin American countries are our close neighbors. In the Organization of the American States and in other international organizations they are our partners in maintaining peace and encouraging progress. Latin America leads all other major commercial areas of the world in trade with the United States and in the investment of United States capital in foreign areas. Many citizens of the United States work in private business and government organizations in those countries; others enjoy vacations in the countries of Latin America and while there spend millions of dollars. Many Latin Americans come each year to the United States for study.

In this whole category of courses, only world regional geography, with an increase of 15 per cent, and Africa, with an increase of 21 per cent, showed a moderate growth in enrollments. In view of the continuing tensions in Europe and Asia it is somewhat surprising that enrollments in courses on Europe, Asia and the USSR declined from 1952 to 1957. However, the figures presented here should not be considered as showing a definite trend.

Enrollments in Other Geography Courses

From 1952 to 1957 enrollments in aspects of geography, other than introductory courses, economic geography and regional geography, increased by only 1.3 per cent as a group (Table IV). With the exception of political geography and historical geography enrollments in all the categories of courses in this group increased; some substantially, others only moderately. Although there were more classes in political geography in 1957 than in 1952, enrollments declined from 12,375 to 6,871. Much of this decline is

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[9] See Preston E. James, "Introduction: The Field of Geography" and Derwent Whittlesey, "The Regional Concept and The Regional Method," in American Geography: . . . op., cit., pp. 2-18 and 19-68.

Table III

Enrollments in Courses on Regional Geography 1952 and 1957 (1)

Regions	1952 No. of Courses	1952 Enrollments	1952 Percentage of Total	1957 No. of Courses	1957 Enrollments	1957 Percentage of Total
Anglo America (2)	342	16,989	32.5	360	17,023	32.2
World Regional	142	7,995	15.2	150	9,188	17.4
Latin America (3)	270	7,068	13.5	266	6,673	12.6
Individual States (4)	106	5,609	10.7	115	6,411	12.5
Europe (5)	227	5,953	11.4	207	5,361	10.1
Asia (6)	209	4,098	7.8	200	3,990	7.5
U.S.S.R.	75	1,572	3.0	69	1,423	2.6
Africa	47	868	1.7	67	1,056	1.9
Others (7)	53	928	1.9	48	924	1.7
Titles not specified	23	1,219	2.3	15	822	1.5
Totals	1,494	52,299		1,497	52,871	

(1) Compiled from the Directory of College Geography of the United States. Vol. V (1954), pp. 6-90 and Vol. IX (1958), pp. 3-53. Department of Geography, University of Kentucky, Lexington.

(2) Includes many courses with the titles Anglo-America and North America; several with United States and Canada, and some only United States, Eastern Anglo-America, Western Anglo-America; and a few, the South.

(3) Includes courses on Latin America, South America, Middle America and Caribbean America.

(4) Special state courses were given in thirty-two states of the United States in both 1952 and 1957. Seven states (California, Pennsylvania, Louisiana, Michigan, Minnesota, Wisconsin, and New York) had in both years about 60 per cent of the enrollments in individual state courses.

(5) Includes all titles in which Europe is used, such as Western Europe, Southern Europe, etc.

(6) Includes several courses with titles such as Far East, Eastern Asia, Southern Asia, and Western Asia, and a few on Japan, India, etc.

(7) About four-fifths of the enrollments in this group were in courses on Australia, the Pacific Islands, and the Pacific; the remainder was in a few courses on Polar Lands and Tropical Lands.

accounted for by the lack of large ROTC classes in 1957; in 1952 twelve ROTC classes had a total enrollment in political geography of 4,303, or nearly 36 per cent of the total in political geography for that year. What the remainder of the decline is due to the writer does not know. In view of the general international situation that might be expected to stimulate interest in the political aspects of geography, this decline is surprising. Neither does the writer know the reasons for the significant decline in enrollments in courses on historical geography.

Geography in the United States had its origin and early growth in the physical aspects. In 1903-4 when The Association of American Geographers was being formed the forty-six founding members included sixteen geologists, nine geographers, six geomorphologists, four explorers, two botanists, one climatologist, and one ecologist.[10] Early in the present century they were the teachers of those who later specialized in the many other branches of geography. So rapid was the expansion in other aspects of the subject that the impression got abroad that the physical aspects were being entirely neglected. This was true to a certain extent. However, the physical aspects of the subject in recent years have experienced renewed vitality. In 1952 enrollments in all aspects of physical geography (including introductory physical geography) comprised 11 per cent of all enrollments in geography courses in the United States; in 1957 about 13 per cent. Only economic geography and continent courses as a group have had a greater enrollment than physical geography. The number of students taking climatology, geomorphology and soils and plant geography increased substantially between 1952 and 1957. Nevertheless, there are very few courses offered for geographers in soils, plant geography, animal geography, water resources of the land, and geography of the oceans. These subjects, as well as meteorology, are being developed and taught more by other scientists than by geographers. By this statement the writer does not imply that

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10 In addition to these persons one man in the Coast Survey and a geographic editor were primarily geomorphologists; there were also one map compiler, one transportation specialist, one statistician, one administrator, and one curator -- J. Russell Smith, "American Geography 1900-1904," The Professional Geographer, Vol. IV (July 1952), pp. 4-7.

Table IV

Enrollments in Aspects of Geography, Other Than Introductory Courses, and Economic Geography and Regional Geography 1952 and 1957 (1)

Aspects	1952 No. of Courses	1952 Enrollments	1957 No. of Courses	1957 Enrollments
Physical Aspects				
Physical Geography (2)	85	4,915	122	5,117
Climatology (3)	203	5,096	206	5,674
Geomorphology (4)	81	2,567	85	3,490
Geology (5)	68	2,223	81	3,186
Others (6)	21	272	26	350
Political and Historical Geography				
Political Geography (7)	205	12,375	219	6,871
Historical Geography (8)	88	1,946	75	1,688
Urban and Settlement Geography				
Urban Geography	40	672	45	812
Settlement Geography (9)	19	290	16	365
Techniques				
Cartography (10)	106	1,587	121	1,783
Field Methods	54	645	67	922
Map Interpretation (11)	38	669	39	754
Photo Interpretation (12)	16	184	19	405
Statistical Methods	2	31	5	51
Others				
Methods of Teaching (13)	74	2,110	89	3,188
Seminars (14)	68	868	155	1,657
Research and Independent Study	85	744	96	875
Philosophy of Geography and Geographers Literature	47	527	51	659
Travel Geography	6	190	10	560
Totals	1,306	37,911	1,527	38,407

(1) Compiled from the Directory of College Geography of the United States, Vol. V (1954), pp. 6-90 and Vol. IX (1958), pp. 3-53. Department of Geography, University of Kentucky, Lexington.

(2) Includes physical geography courses presumed not to be introductory courses.

Table IV

(continuation of footnotes)

(3) Includes courses with the titles of Climatology, Meteorology, Climate and Weather, Climates of the World and Regional Climatology.

(4) Includes courses with the titles of Geomorphology, Physiography, and Landforms.

(5) Many of these geology courses are offered in departments with the titles of department of Geography and Geology, or department of Geology and Geography.

(6) Includes several courses in Soils, Plant Geography, and a few courses on Oceanography.

(7) Includes courses in Political Geography, Geopolitics, Foundations of World Power, World Affairs, and World Problems.

(8) Includes courses in Historical Geography and Geographic Influences on History.

(9) Includes a few courses in population geography.

(10) Includes courses in Cartography, Graphics, and Map Design and Construction.

(11) Includes courses in Maps, Map Interpretation, and Map intelligence.

(12) Includes courses in Photointerpretation and Photogrammetry.

(13) Includes courses in Methods of Teaching Geography, Geographic Education, and Geography for Teachers.

(14) The seminars include several small classes on the separate continents and on other advanced phases of geography.

substantial work has not been done in these fields by geographers.[11] However, these branches of the discipline may represent in the future even more productive fields for research and teaching by geographers.

In course offerings in colleges and universities of the United States and enrollments in them, settlement geography and urban geography represent two of the smaller subdivisions of the discipline (see Table IV). Their recognition as distinct subdivisions of geography came relatively recently. This statement does not imply that no studies of rural settlements and urban centers were made until recently. Patterns and processes of rural settlement have long constituted parts of both regional and topical studies by geographers in the United States. At first the chief interest in settlement geography in the United States was the examination of the processes of settlement in pioneer areas.[12] More recently, the study of types, forms, structure and function of settlement features and the formulation and testing of concepts with respect to them have given distinctiveness to settlement geography. Early studies of urban centers in the United States dealt with their physical sites and their distribution.[13] More recently, many studies of the types, internal forms and patterns, functions and distribution of cities and the kinetic relations of cities to their tributary areas have given a distinctive character to urban geography. With the continued urbanization of the population of the United States and its concomitant problems, it is expected that work in urban geography will increase more rapidly than it has in the recent past.

Enrollments in technique courses, such as cartography, field methods, map interpretation and photointerpretation, registered substantial increases between 1952 and 1957. It may be said that the making of maps and the development of geography grew up in close association. The geographer in dealing with the

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11 See Carleton P. Barnes, "The Geographic Study of Soils"; Peveril Meigs III, "The Geographic Study of Water on the Land"; C. J. Burke and Francis E. Elliot, "The Geographic Study of the Oceans"; A. W. Kuchler, "Plant Geography"; and L. C. Stuart, "Animal Geography"; in American Geography: . . . op. cit., pp. 382-451; F. Kenneth Hare, "Geographical Aspects of Meteorology", and D. F. Putnam, "Soils and Their Geographical Significance", in Griffith Taylor (Editor), Geography in the 20th Century, Philosophical Library, New York, 1947, pp. 178-194 and 221-247.

12 See Clyde F. Kohn, "Settlement Geography" in American Geography: . . . op. cit., pp. 124-141.

13 See Harold F. Mayer and Edward L. Ullman, "Urban Geography" in American Geography: . . . op. cit., pp. 142-166.

significance of differences from one place to another on the earth, is greatly handicapped without accurate maps and the cartographer is likewise at a great disadvantage without a knowledge of at least some of the significant characteristics of the elements he is to map. World War II gave cartography a tremendous impetus. During the war a large proportion of the cartographers in the United States, and many geographers as well, were pressed into service in designing, drafting and reproducing maps of many parts of the world. "At least half of the geographical personnel employed by the government during World War II was engaged in cartographic work" . . . Probably more maps were made and printed during the five years from 1941 to 1946 than had been produced in the aggregate up to that time."[14] Prior to 1940 there was neither an Army Map Service nor an Aeronautical Chart and Information Service as such. In 1941 the map collection and map work of the War Department were moved from the General Staff to the Corps of Engineers, merged with its reproduction plant, and in 1942 became the Army Map Service, with the responsibilities of map procurement, map intelligence, compilation, drafting and printing of maps for the ground forces. The personnel and facilities of the Hydrographic Office of the Navy, Coast and Geodetic Survey, Topographic Branch of the Geological Survey, other regular branches, and many war-time agencies, such as the Office of Strategic Services and Board of Economic Warfare, were used to meet the urgent demand for all kinds of maps. The Aeronautical Chart and Information Center was created and became a hugh map-making agency.[15] The American Congress on Surveying and Mapping, founded in 1941, has become a large professional cartographic organization. The Pan American Institute of Geography and History, Commission on Cartography, established in 1941, has become an active international cartographic

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14 Arthur H. Robinson, "Geographic Cartography", in American Geography . . . op. cit., pp. 553-577; quotes from page 558.

15 The Military Air Transfer Air Photographic and Charting Service was organized in 1923 to supply aeronautical charts to United States military aircraft, but it was not until early in World War II that ACIC started to develop aeronautical charts on a world-wide basis. Robert E. Cramer, "Cartography at The Aeronautical Chart and Information Center," The Professional Geographer, Vol. VIII (November 1956), pp. 7-9.

organization.[16] The Cartographic Section of the Bureau of Economic Affairs of the United Nations is actively engaged in cartographic work in many parts of the world and publishes annually World Cartography. All these things have brought about increased attention to cartography in departments of geography. However, despite these developments and the continued active demand for more cartographers than can be supplied, less than 2000 students per year take courses in cartography in schools that offer work in geography. Of these schools only 104,[17] or only 9 per cent, offered courses in cartography; less than half of the departments of geography give work in cartography. Cartography naturally belongs in departments of geography. The demand by ACIC for personnel trained in geography has become so great that recruitment in some branches is confined to geography majors, and geography graduate students. ACIC officials annually visit geography departments to recruit cartographers and to interest geography professors in guiding qualified students to ACIC.

Although closely allied to cartography, map interpretation and photointerpretation receive much less attention by geography students than does cartography. Less than a thousand students each year in schools that offer work in geography take map interpretation and less than 500 take photointerpretation (see Table IV). Of the schools which offered work in geography in 1957 only 39, or 3.5 per cent, gave courses in map interpretation, and only 17, or 1.5 per cent, in photointerpretation. There seems to be a great need for increased offerings in all three of these geographical techniques. The out-of-doors is considered by most professional geographers to be the real geographical laboratory.[18] Yet less than 1000 students in schools that offer work in geography take courses in field methods. Of the schools offering work in geography in 1957 only 55, or about 5 per cent, gave courses in field methods; in other words, only one-fourth of the departments of geography offered work in field methods.

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16 The Pan American Institute of Geography and History, PAIGH Publication No. 180, Mexico City, 1954, p. 2. The Latin American countries have done more mapping of their land and sea since 1941 than had been done in previous centuries.

17 These figures for schools offering courses in cartography, map interpretation, photointerpretation and field methods do not agree with the number of courses in Table IX, because some schools gave more than one course in each of these techniques.

18 See Charles M. Davis, "Field Techniques", in American Geography: . . . op. cit., pp. 496-530; reference on page 498.

Schools Offering Work in Geography and Departmental Status.

Between 1952 and 1957 the number of schools offering work in geography increased from 954 to 1139, an increase of nearly 20 per cent (Table V). One hundred forty-six, or 46 per cent, more schools offered only one course one or more times during 1957 than in 1952. Seventy-eight, or 46 per cent, more schools gave two courses in geography one or more times during 1957 than in 1952. In all these schools the courses given were of an introductory nature. In contrast to the above trend, schools offering more than two courses declined from 471 in 1952 to 432 in 1957. In 1952 the schools with more than two courses accounted for 50 per cent of all schools offering work in geography; in 1957 about 38 per cent. These latter percentages indicate a wider spread geographically of course offerings in 1957. However, although the one-and-two-course schools give thousands of students an idea that something called "geography" does exist and they also provide these students with some understanding of the world, they and their teachers contribute little to the development of geography as a separate discipline.

A significant trend with respect to geography in colleges and universities in the United States is the increasing number of departments that carry the word "geography" as part of the departmental title. Such departments increased from 193 in 1952 to 222 in 1957, a growth of 15 per cent. In the latter year 128 had the title of geography only and 80 the title of geography and geology, or geology and geography. In all the departments with the title of geography and geology the emphasis seems to be on geography rather than geology. In 129 schools geography was offered in the social science (or studies) department and in 45 institutions in the social science (or studies) division. In other schools geography was given in various departments as follows: economics 40, science 29, education 16, earth science 14, geology 9, history 9, sociology 7, and history and political science 7.[19] In schools where geography is given in economics departments the courses generally are related to some aspect of economic geography. In schools in which geography is given in departments of education, history, political science, sociology, etc., the geography offerings are generally restricted. Such situations and also those departments in which geography is not offered, hinder greatly the development of geography because of the attitude of many social

[19] These figures were compiled from Directory of College Geography in the United States, Department of Geography, University of Kentucky, Lexington, Vol. IX, 1958, pp. 58-93. Nearly 600 schools did not designate the departmental status of geography.

Table V

Number of Schools, Courses and Instructors in Geography in the United States 1952 and 1957 (1)

	1952	1957
Number of schools offering work in geography (2)	954	1,139
Schools offering only one course one or more times during the year	315	461
Schools offering two courses only one or more times during the year	168	246
Schools offering more than two courses	471	432
Schools with one full-time geography instructor	612	732
Schools with two full-time geography instructors	189	222
Schools with three full-time geography instructors	63	70
Schools with four full-time geography instructors	36	33
Schools with five full-time geography instructors	18	26
Schools with six full-time geography instructors	16	23
Schools with seven full-time geography instructors	3	12
Schools with eight full-time geography instructors	3	6
Schools with nine full-time geography instructors	4	1
Schools with ten full-time geography instructors	2	4
Schools with more than ten full-time geography instructors	8	10
Total full-time geography instructors (3)	1,718	2,101
Instructors with doctorate	587	852
Schools offering graduate work in geography	68	78
Schools having departments of geography	193	222

(1) Compiled from Directory of College Geography of the United States, Vol. V (1954), and Vol. IX (1958), Department of Geography, University of Kentucky, Lexington.

(2) Does not include military schools, seminaries and other special schools.

(3) An unknown number of these presumably teach geology and not geography (see Table IV).

scientists towards geography as a discipline. One might suppose that students would be more attracted to geography in those schools which recognize the discipline with departmental status. Eighty-two schools (only 7.1 per cent of the schools offering work in geography) each with more than 900 enrollments in geography courses in 1957 had 44 per cent of the total enrollments in geography in the United States (Table VI). In fifty-two of these schools geography has separate departmental status; in seven, geography and geology; in four, geology and geography. In general, the number and variety of courses in all these departments are greater than in other schools.

Of the above 82 schools all except eight are state or city supported institutions. This is quite representative of the United States as a whole. The Directory of College Geography in the United States lists for 1957 on pages 54-57 nearly 470 institutions reporting no courses in geography. Of these at least 400, or 87 per cent, are private institutions. In the United States as a whole relatively little geography is taught in private institutions. However, a few private colleges and universities, all well known to the professional geographer, have some of the best departments of geography, whose staffs in their effective teaching and research are doing much to bring about a broader appreciation of what geography has to offer. The reasons why so many private liberal arts colleges employ so few geographers are many. Most students entering college in the United States have had no contact with geography in the high school. In this respect the United States is far behind European countries and the USSR.[20] For decades many smaller private colleges, always following the example of a few of their peer institutions which were not appointing geographers, did not favor adding geography to their curricula.[21] When the

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20 See Chauncy D. Harris, "Geography in the Soviet Union", The Professional Geographer, Vol. X (January 1958), pp. 8-13; Roger H. Charlier, "The Study of Geography in Belgium", The Professional Geographer, Vol. IX (May 1957), pp. 10-14; Klaus Schroeder, "The Study of Geography in East Germany", The Professional Geographer, Vol. VIII (July 1956), pp. 13-15.

21 Harvard University was late in introducing geography, except for geomorphology and climatology into its curricula; and course offerings in geography at Harvard again ended with the spring term of 1956-57 academic year after the death of Professor Derwent Whittlesey -- Directory of College Geography . . . Vol. IX (1958), p. 73. Early in 1958 Harvard's Climatologist, Professor Charles F. Brooks, passed away. It is not known whether Harvard plans replacements for these leading geographers. For years the only geography offered at Princeton University has been given by a geologist and a political scientist.

Table VI

Schools with Enrollments of More than 900 in Geography Courses in 1957

Schools	Enrollments	Departmental Status
Alabama Polytechnical Institute	1,433	Economics and Business Administration
Alabama State College, Montgomery	1,052	Geography
Arizona State College, Tempe	979	Geography
Long Beach State College, California	1,471	Social Science Division
Los Angeles City College	1,154	Earth Science Department
Los Angeles State College	1,104	Geography
San Diego State College	963	Geography
San Francisco State College	902	Geography
Stanford University	1,274	Geography
University of California, Berkeley	1,624	Geography
University of California, Los Angeles	3,075	Geography
University of Colorado	1,887	Geography
Georgetown University, D. C.	928	Geography
Florida State University	932	Geography
University of Miami, Florida	1,647	Geography
University of Georgia	1,795	Geography and Geology
Illinois State Normal University, Normal	1,073	Geology and Geography
Northern Illinois University, DeKalb	2,293	Earth Science
Northwestern University	1,866	Geography
Southern Illinois University, Carbondale	2,065	Geography
University of Illinois	1,370	Geography
Western Illinois University, Macomb	904	Geography and Geology
Ball State Teachers, Muncie	1,161	Science Department
Indiana State Teachers, Terre Haute	1,529	Science Division
Indiana University	1,874	Geography
Valparaiso University	1,144	Geography and Geology
Iowa State Teachers, Cedar Falls	1,199	Science Department
State University of Iowa	1,525	Geography
University of Kansas	907	Geography
University of Kentucky	1,653	Geography
Western Kentucky State College	1,230	Geography and Geology
Louisiana State University	1,732	Geography and Anthropology
Southern University, Baton Rouge	952	Social Studies
Southwestern Louisiana Institute	1,643	Social Studies
University of Maryland	1,893	Geography
Northeastern University, Boston	1,260	Economics
Central Michigan College, Mt. Pleasant	1,777	Geography
Eastern Michigan College, Ypsilanti	2,480	Geography

Table VI
(continued)

Schools	Enrollments	Departmental Status
Flint Community College, Flint	927	Science Division
Michigan State University, East Lansing	1,960	Geography
University of Michigan	2,493	Geography
Wayne State University	1,048	Geography
Western Michigan College, Kalamazoo	1,716	Geography and Geology
Manikato State College, Minnesota	1,531	Geography
St. Cloud, State College, Minnesota	1,573	Social Studies Division
University of Minnesota, Minneapolis	2,801	Geography
University of Minnesota, Duluth	1,183	Geography
University of Missouri	1,281	Geography
University of Nebraska	1,084	Geography
New Jersey State Teachers, Paterson	1,006	Social Studies Department
New Jersey State Teachers, Trenton	946	Geography
Syracuse University	1,340	Geography
Columbia University, New York	907	Geography
Teachers College Cortland, New York	908	Social Studies Department
Appalachian State Teachers College, Boone	981	Social Studies Department
East Carolina College, Greenville, North Carolina	2,590	Geography
Bowling Green State University, Ohio	1,812	Geography
Kent State University, Kent, Ohio	1,395	Geography and Geology
Miami University, Oxford, Ohio	1,783	Geography
Ohio State University, Columbus	4,484	Geography
University of Cincinnati	1,241	Geology and Geography
University of Oklahoma	1,212	Geography
Oregon State College, Corvallis	1,798	Natural Resources Department
Portland State College, Oregon	1,589	Social Science Department
Pennsylvania State University	1,775	Geography
State Teachers College, California, Pennsylvania	923	Geography
State Teachers College, Indiana, Pennsylvania	1,426	Geography
State Teachers, Millersville, Pennsylvania	913	Geography
State Teachers College, West Chester, Pennsylvania	1,149	Geography
University of Pittsburgh	1,301	Geography
University of South Carolina	1,090	Geology and Geography
East Tennessee State College, Johnson City	1,276	Geography and Geology
Memphis State College, Memphis	1,940	Geography
University of Tennessee	1,949	Geology and Geography
North Texas State College, Denton	1,313	Geography
University of Utah	966	Geography
Eastern Washington College of Education	931	Geography
University of Washington	2,048	Geography
Western Washington College of Education	996	Social Studies Department
University of Wisconsin, Madison	2,115	Geography
University of Wisconsin, Milwaukee	1,081	Geography
Wisconsin State College, La Crosse	900	Geography
82 schools	121,431	

(1) Compiled from Directory of College Geography in the United States, Vol. IX, 1958, pp. 11-93, Department of Geography, University of Kentucky, Lexington.

urgent need for geographers developed during World War II and thereafter, the government, state universities and teachers colleges outbid most private schools for the available geographers. "By the time the bottom of the pile was reached the liberal arts schools, as proud and selective of their faculties as the best universities, were no longer interested."[22] Fortunately there seem to be signs that this entire situation may be changed, because of the increasing interest in geography as mentioned in the early part of this report.

Instructors in Geography, Instructors with Doctorate and Schools Offering Graduate Work.

According to the figures compiled from the Directory of College Geography in the United States, 1718 instructors were engaged full-time in teaching geography in 1952 and 2101 in 1957; this represents an increase of about 22 per cent (see Table V). About 36 per cent of these instructors in 1952 were in schools that had only one full-time instructory in geography; in 1957, about 35 per cent. The number of schools having one full-time geography teacher increased by 120 between 1952 and 1957. Schools with two full-time geography instructors had about 22 per cent of the teachers in both years, but there were thirty-three more schools in this category in 1957. Thus at least half of the geography instructors in the United States are engaged in schools that offer relatively few courses, and these are primarily of an introductory nature. It is interesting to note that the schools with only one instructor represented 65 per cent of all schools offering work in geography in 1952 and 64 per cent in 1957. Likewise, those with two instructors constituted nearly 20 per cent of all institutions with work in geography in both 1952 and 1957. Institutions with three, four and five geography instructors together had 24 per cent of the geography teachers in 1952 and 22 per cent in 1957, with twelve more departments in 1957. In 1952 about 18 per cent of the geography teachers were in 36 departments each of which had six or more instructors, and in 1957 the corresponding figures were nearly 21 per cent in 56 departments. In other words, in 1952 the 152 schools each with three or more geography instructors had 727 teachers; the corresponding figures for 1957 were 185 schools with 925 geography instructors (see Table V). These figures indicate a healthy growth in the teaching force of the departments of geography which naturally have the greatest number and variety of courses and in which the staff members by their teaching and research are making distinct contributions to the development of the discipline.

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22 Homer Aschmann, "Geography in the Liberal Arts Colleges", The Professional Geographer, Vol. X (March 1958), pp. 2-6.

According to figures compiled from the Directory of College Geography in the United States, the number of geography instructors with the doctorate increased from 587 (555 with the Ph. D. and 32 with other doctoral degrees, such as Ed. D.) in 1952 to 852 (801 with the Ph. D. and 51 with other Doctors' degrees, such as Ed. D.)in 1957, an increase of 45 per cent. On first thought this would appear to be a large increase. However, between 1952 and 1957 the number of doctorates conferred was apparently sufficient to take care of this growth.[23] Even if the increase is not quite as large as these figures indicate, it is nevertheless a significant growth.

Sixty-eight schools in 1952 had programs of graduate work in geography, with a total of 687 candidates for advanced degrees -- 413 for the Master's degree and 274 for the Doctor's degree.[24] Thirty-seven of these departments gave graduate work for the Master's degree only and 31 for both Masters and Doctors. Seventy-eight departments in 1957 offered graduate work in geography -- 40 for the Master's degree only and 38 for both Master's and Doctor's degrees. These schools in 1957 conferred 187 Master's degrees and 53 Doctor's degrees. Not including the persons awarded degrees, these 78 departments in 1957 had 949 candidates for advanced degrees in geography -- 612 for the Masters and 337 for the doctorate.[25] These figures indicate a very significant growth in graduate work in geography. Although the number of departments offering graduate work in geography increased by only ten, the number of candidates for advanced degrees increased by nearly 39 per cent. This rate of growth is more than twice that of total enrollments in geography courses in the United States.

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23 The number of doctorates conferred in 1952 was 42; in 1953, 45; in 1954, 53; in 1955, 57; in 1956, 55; and in 1957, 53 - a total of 305 in six years. Compiled from the listings of titles of dissertations in various issues of The Professional Geographer, and checked with schools awarding degrees each year, in the Directory of College Geography of the United States, Department of Geography, University of Kentucky, Lexington. Volumes V to IX, inclusive. These figures may not be entirely complete, but not many degrees awarded were unreported in these publications.

24 Compiled from the Directory of College Geography, ... Vol. V, 1954, loc. cit., pp. 91-128.

25 These figures were compiled from the Directory of College Geography, . . . Vol. IX, 1958, loc. cit., pp. 58-93.

Doctoral Dissertation Research.

From 1952 and 1957 inclusive, 305 dissertations in geography were completed (Table VII). The number written in this period is only about 31 per cent less than all dissertations in geography completed in the United States prior to 1952.[26] In the period 1952 to 1957 doctoral dissertation research is characterized by a wide variety of subject matter. In Table VII all dissertations are grouped into five main categories: economic geography, settlement-urban-historical-political as a group, regional geography, physical geography, and other aspects of geography. These five are subdivided into seventeen subcategories. In this period nearly 40 per cent of the dissertations deal with some aspect of economic geography, such as agriculture, land utilization, manufacturing, trade -- forest industry, mining and fishing. Nearly 31 per cent of the total dissertations fall in the second main category (urban, historical, settlement, political, and population geography); about 11 per cent in regional geography;[27] 8 per cent in physical geography; and about 10 per cent in other aspects of geography (geography in education, techniques, and others, such as recreational geography and planning). For this period, the dissertations in economic geography represent a much larger proportion of the total than they did prior to 1952; those in the "all other aspects of geography" category are greater in this period than prior to 1952.

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26 See Clyde Browning, Burton Kelso, Rodney Steiner, "Trends in Geographic Dissertation Subjects: 1906-1953," The Professional Geographer, Vol. VIII (March 1956), pp. 8-14; Derwent Whittlesey (Compiler), "Dissertations in Geography Accepted by Universities in the United States for the Degree of Ph. D. as of May 1, 1935," Annals of the Association of American Geographers, Vol. 25 (1935), pp. 211-237; Leslie Hewes (Compiler), "Dissertations in Geography Accepted by Universities in the United States and Canada for the Degree of Ph. D., June 1935 to June 1946, and Those Currently in Progress," Annals of the Association of American Geographers, Vol. 36 (1956), pp. 215-247; Leslie Hewes (Compiler), "Titles of Theses in Geography" (Accepted June 1946 to November 1951), The Professional Geographer, Vol. II (January 1950), pp. 8-11, (March 1950), pp. 11-15, (June 1950), pp. 14-17, (October 1950), pp. 11-12; Vol. III (January 1951), pp. 10-17, (February 1951), pp. 10-12, (July 1951), pp. 10-13, (November 1951), pp. 34-35.

27 Only those dissertations, for which the titles indicated that they deal with both physical and cultural features, or the geography, of an area, are placed in this category.

The percentage in the second main category, as indicated above, is about the same for the two periods; but the percentages in regional geography and physical geography are much less in this period than in the period prior to 1952. One cannot assume from these relative shifts in these main categories that they represent a permanent trend in the interests of doctoral candidates. One interesting observation that resulted from the examination of all the dissertation titles is that relatively few doctoral candidates attempt to cover all aspects of economic geography as such, or of physical geography as such. One might expect a more or less direct correlation between the number of dissertations written in the various aspects of geography with the number of geographers, who are specialists in these aspects of the discipline. For information on this matter see Table XII.

Although the period, 1952 to 1957, is too short and the variation from year to year in the number of dissertations in a given subcategory is too great to indicate definite trends, some observations may be of interest.

Dissertations in Economic Geography

Economic geography dissertations constituted nearly 60 per cent of all dissertations in 1952; 34 per cent in 1957.[28] For the period 1952 to 1957 agricultural geography and land utilization theses make up about one-half of the total in this main category; but the percentage for these two subcategories together varies from nearly 40 per cent in both 1952 and 1957 to nearly 60 per cent in both 1954 and 1955. Actually, the consideration of aspects of the agricultural use of the land comprises a significant part of most dissertations on land utilization. Doctoral research in these two aspects of geography, as revealed by the examination of several dissertations, shows two contrasts of approach: (1) contrast between topical and regional approach, and (2) between intensive studies of small areas and broader studies of larger areas.[29]

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28 Nearly 23 per cent of the professional geographers of the United States consider economic geography in general or some aspect of it their chief field of interest (see Table XII).

29 Refer to dissertations in the lists of titles on later pages; see also parts of dissertations, growing out of the Rural Land Classification Program of Puerto Rico and published in Clarence F. Jones, "The Rural Land Classification of Puerto Rico," Northwestern University Studies in Geography, 1952, and Clarence F. Jones and Rafael Pico, Symposium on the Geography of Puerto Rico, University of Puerto Rico Press, 1954.

In these respects research is similar to that prior to 1952.[30] However, there seems to be a distinct trend towards more quantitative methods of handling the data.

Contrasted with the number of dissertations on agricultural geography, that on manufacturing geography in this period is relatively small. The dissertations concerned with this subcategory comprise for the period about 18 per cent of those of the economic geography category and 7 per cent of all dissertations. The number from year to year is relatively constant. An examination of several dissertations in this subcategory reveals that they as a group deal with problems of specific industries, industrial areas, location theory and location types -- generally on a more quantitative basis than formerly.[31]

Dissertations on trade and transportation geography (mostly the latter) comprise for the period about 14 per cent of those in the economic geography category, and 5 per cent of all dissertations. Doctoral and other research in transportation geography seems to be definitely on the increase and distinctly more quantitative than formerly, despite the difficulty in the United States in obtaining statistics of route traffic flow and of origin and destination of traffic.[32]

In the period under consideration dissertations on water resources and extractive industries are relatively few. However, they constitute 4 and 3 per cent, respectively, of all dissertations, a slightly higher percentage than prior to 1952.[33] Those on water resources deal especially with problems of water for irrigation. A few years ago Peveril Meigs III stated that "Of the various elements that make up the geographic scene, water probably has been studied least systematically by geographers."[34] The relative number of dissertations in this subcategory of the discipline indicate that this assertion is still true. In view of the ever-increasing significance of minerals in our modern civilization it is surprising to find that in the period under consideration less than half of the dissertations in this subcategory --

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30 See Harold H. McCarty, "Agricultural Geography," in American Geography: . . . op. cit., pp. 258-277.

31 See Chauncy D. Harris, "The Geography of Manufacturing," in American Geography: . . . op. cit., pp. 293-308.

32 See Edward L. Ullman and Harold M. Mayer, "Transportation Geography, " in American Geography: . . . op. cit., pp. 310-332.

33 Clyde Browning, op. cit., p. 9.

34 See Peveril Meigs III, "The Geographic Study of Water on the Land," in American Geography: . . . op. cit., pp. 396-409.

Table VII

Subject Matter of Dissertations 1952 to 1957 (1)

	1952	1953	1954	1955	1956	1957	Total	Percentage of Total
Economic Geography								
Agriculture	7	4	6	7	6	3	33	
Land Use	2	5	5	7	3	4	26	
Manufacturing	4	3	3	3	5	4	22	
Trade and Transportation(2)	6	1	2	1	4	3	17	
Water Resources	3	2	1	4	1	2	13	
Extractive Industries	2	-	2	2	1	2	9	
Sub-totals	24	15	19	24	20	18	120	40.0
Urban-Historical-Settlement Political-Population Geography								
Urban Geography	1	4	2	10	5	3	25	
Historical Geography	1	1	9	3	3	6	23	
Settlement Geography	4	4	2	2	5	4	21	
Political Geography	2	1	4	3	2	6	18	
Population Geography	-	1	-	2	3	1	7	
Sub-totals	8	11	17	20	18	20	94	31.0
Regional Geography	4	7	6	5	7	5	34	11.0
Physical Geography								
Climatology	2	4	5	3	3	-	17	
Geomorphology	1	4	-	-	2	2	9	
Soils Geography	-	-	-	1	-	1	2	
Sub-totals	3	8	5	4	5	3	28	8.0
Other Aspects of Geography								
Geography in Education	2	3	1	3	1	4	14	
Techniques	-	-	4	1	2	2	9	
Other	1	1	1	-	2	1	6	
Sub-totals	3	4	6	4	5	7	29 (3)	10.0
Grand Totals	42	45	53	57	55	53	305	

(1) Compiled from listings of titles of dissertations in various issues of The Professional Geographer, and checked with schools awarding degrees each year in Directory of College Geography in The United States, Volumes V to IX.

(2) Except for three, all these were in some aspect of transportation geography.

(3) Most of these dissertations are grouped in the last two categories of Table VIII because they deal with subject matter not readily classifiable by areas within the United States; a few deal with geography in education in other countries.

forest industries, mining, and fisheries -- deal with individual minerals, individual mining regions, or patterns of mineral production. The relatively small number of dissertations in the geography of mineral production as such, does not mean that doctoral research largely ignores minerals. As most minerals constitute raw materials for factories, and as mineral production and facilities for transporting mineral products are significant in plant location, many dissertations in the geography of manufacturing devote considerable emphasis to the mining, transportation, and processing of minerals. Likewise, minerals, or mining, come in for some attention in many studies of land utilization, trade and transportation, settlement geography, urban geography and even of political geography, but in such cases minerals are only one facet of a broad structure or pattern, and such treatment in general does not cover individual mining regions or the pattern of mineral production as such. Nevertheless, the geography of mineral production has a distinctive core,[35] and as such merits more research on the part of doctoral candidates in geography and of other scientists.

Dissertations in Urban-Historical-Settlement-Political and Population Geography

The second main category--urban - historical-settlement-polititical-population geography--accounts for 31 per cent of the dissertations in geography completed from 1952 to 1957 inclusive, about the same percentage of such theses prior to 1952.[36] The number of dissertations in each of the subcategories varied considerably from year to year.[37]

Dissertations in urban geography, the leading subcategory, comprise nearly 27 per cent of the dissertations of the major category and 8 per cent of all dissertations for the period under consideration. The twenty-five theses in urban geography vary greatly in method of approach and emphasis. However, on the basis of emphasis they may be placed in four groups: (1) The major emphasis in seven is on the geographic factors in the growth of a single city or a group of urban centers of an area, (2) seven emphasize the kinetic relations of a city to its tributary area, including the suburban fringe of a central city, (3) six deal chiefly

35 See Raymond E. Murphy, "The Geography of Mineral Production," in American Geography: . . . op. cit., pp. 278-290.

36 Clyde Browning, op. cit., p. 9.

37 Fifteen per cent of the geographers in the United States consider either urban, political, historical, settlement, or population geography as their first field of specialization (see Table XII).

with one or more than one function of a given city, and (4) five are focussed upon the internal structure and pattern of an urban area.

Dissertations in historical geography account for about 24 per cent of those in the main category and 7 per cent of all dissertations for the period. The number of theses here classified as historical geography for this short period is nearly 27 per cent greater than all dissertations written in this subcategory prior to 1952. Thus it seems to be a rapidly developing aspect of geography, at least as far as doctoral dissertations are concerned. Of the twenty-three dissertations in historical geography, ten deal with a town (5), county (2), state (1), or island (2); four with changes in the function of settlement or occupance of a small area; two with prehistoric settlement of a small area; and three are of a more general nature, such as "The Historical Geography of the Range Livestock Industry of California." Perhaps another geographer would have put some of these theses in another subcategory, but in the opinion of the writer all of them have the principal characteristics of studies in historical geography,[38] even though in some of them the words "historical geography" do not appear in the title. A third of all the dissertations in historical geography were written in one department.

Dissertations in settlement geography comprise 22 per cent of those in the main category and nearly 7 per cent of all those for the period, 1952-1957. From two to five dissertations in this subcategory were completed each year. They were written in a dozen different departments, no one department having more than three. Although they vary considerably in approach and emphasis, they are readily grouped into four types: (1) eight deal with current characteristics and patterns of rural settlements in small areas; eight with the processes and problems of modern settlement in relatively small pioneer areas; three with sequent occupance (settlement) patterns in small areas; and two are of a more general character.

For the period being considered dissertations in political geography comprise nearly 20 per cent of those in this main category and nearly 6 per cent of all theses. The number completed in this period is two-and-one-half times as great as those prior to 1952. Thus political geography, although long recognized as an essential part of geography, is relatively new as a distinct branch of the discipline. Also, it remains one of the less developed aspects of the subject. The number of doctoral candidates and other research scholars engaged chiefly in research in political geography remains small. "In perhaps no other branch of

[38] Andrew H. Clark, "Historical Geography", in American Geography: . . . . op. cit., pp. 70-105.

geography has the attempt to teach others gone so far ahead of the pursuit of learning by the teachers."[39] Of the eighteen dissertations in political geography completed in 1952 to 1957, five deal with the political geography of independent states; four with minority groups, migration, and expansion; four with a city, port, canal, or small dependent area; three with boundary problems; and two with the interrelations of several states. These were written in a dozen departments, no department having more than three.

The number of dissertations in population geography in the period is certainly too small for one to ascertain significant trends. Three of them deal with problems of population pressure in part of southern Asia; three with patterns of population distribution in individual political units; and one with the growth of population. The small number of dissertations labelled population geography is not an indication that population does not receive greater consideration in doctoral research, because population numbers, distribution, character and increase are significant aspects of many dissertations in several aspects of economic geography and in the other four subcategories with which population geography is here grouped. Yet in such cases population generally receives inadequate treatment. Population geography as such is still largely an undeveloped branch of the discipline. Population geography offers challenging opportunities for basic research for doctoral candidates in geography and for others. "There are at least four frontiers of research: (1) the development of more satisfactory methods of mapping the distribution of population; (2) the construction of past population patterns; (3) the search for methods of recording more clearly the dynamics of population changes; and (4) the correlation of studies of the cultural characteristics of population with other geographic phenomena."[40]

Dissertations in Regional Geography

The dissertations, classified here as regional geography, comprise 11 per cent of all theses completed in 1952-1957 inclusive. Nearly as many dissertations were completed in regional geography in 1952-1957 inclusive, as in any previous six-year period. Yet in the period prior to 1952 about 24 per cent of all dissertations in geography were classified as regional geography.[41]

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39 Richard Hartshorne, "Political Geography," in American Geography: . . . . op. cit., pp. 167-225; quote from page 170.

40 Preston E. James, "The Geographic Study of Population", from page 116; see also G. T. Trewartha, "The Case for Population Geography", Annals of the Association of American Geographers, Vol. 43 (1935), pp. 71-97.

41 Clyde Browning, op. cit., p. 9.

The dissertations in this subcategory indicated no subject matter other than a particular locale. Apparently relatively fewer and fewer doctoral candidates select the geography of a region as such for a dissertation topic.[42] This seems to be true despite the fact that quite a few geographers feel that regional geography is one of the better branches of the discipline in which to do a dissertation because of the training it gives in (1) the statement of complex but specific problems, (2) field work and research, and (3) correlative evaluation and analysis of a variety of physical and cultural elements.[43] Of the thirty-four dissertations here classified as regional geography, fourteen analyze the geography of small areas, such as "The Temuco Region: A Geographic Study in Central Chile"; eleven deal with river basins or valleys, such as "The Regional Geography of the Powder River Basin, Wyoming and Montana"; three discuss the regional geography of larger areas; three the geography of counties in the United States. These theses were written at seventeen universities, with no department having more than four.

Dissertations in Physical Geography

From 1952 to 1957 inclusive about 8 per cent of the dissertations in geography in the United States were in aspects of physical geography -- geomorphology, climatology, and soils. This is roughly the same percentage they comprised of all theses in geography written before 1952. For the period, 1952-1957, those in climatology make up 61 per cent of those in this main category; geomorphology 32 per cent; soils 7 per cent.

Of the seventeen dissertations, classified as climatology, ten analyze the climates of areas in North America, Europe and Asia; seven deal with special aspects of climate, such as "Variability of Monthly Precipitation in the United States", "Variability of Precipitation in Europe", "Tornado Deaths in the United States", "Climate and Summer Fogs in the Bay Area, California", etc. Eight departments shared the dissertations on climatology; Clark six; University of California at Berkeley, four. The relatively few dissertations on climatology is in part a result of the fact that

42 This is true despite the fact that 25 per cent of United States geographers consider "regional geography" as their first field of special interest (see Table XII).

43 See Derwent Whittlesey, "The Regional Concept and the Regional Method," in American Geography: . . . op. cit., pp. 19-68; G. W. S. Robinson: "The Geographical Region: Form and Function," Scottish Geographical Magazine, Vol. 69 (1953), pp. 49-59; Robert S. Platt, "Field Approach to Regions," Annals of the Association of American Geographers, Vol. 25 (1935), pp. 153-174.

relatively few professors of geography themselves carry on research in it[44] and thus they do not interest many doctoral candidates in going into climatology, which is to a considerable degree a discipline in itself.[45]

In the United States relatively few departments of geography emphasize geomorphology or physiography in their programs of graduate work, despite the importance of a basic knowledge of land forms in so many of the branches of geography. Of the nine theses, here classified as geomorphology, three analyze the geomorphology of small areas; three treat classification of landforms in relatively small areas; two deal with glacial water levels and glacial deposits; and one analyzes the origin of pediments in southeastern Arizona. These nine dissertations were written in seven departments. As pointed out above most of the geographers in the United States fifty years ago were specialists in geomorphology.[46] Many of the early dissertations and other contributions in geomorphology emphasize structure, process, and stage, and as such they lack what we may call the geographical approach. Many of them do not consider the landforms actually existent in a given region, their individual features and their distributional patterns.[47] The lack of interest in geomorphology on the part of so many geographers is due in large part (in my opinion) to the fact that classical geomorphology does not give the geographer what he wants and needs. "The geographer needs categories of landforms, defined at a proper degree of generalization and mapped with the attention to detail appropriate to the map scale".[48] Perhaps the three above dissertations on classifi-

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44 Not more than 4 per cent of the geographers of the United States consider climatology their first field of specialization and less than 4 per cent the second field of interest (see Table XII).

45 John Leighly, "Climatology", in American Geography: . . . op. cit., pp. 334-361; D. H. K. Lee, "Physiological Climatology", ibid, pp. 470-483.

46 The classifications of titles and abstracts of papers prescribed at annual meetings of A. A. G. during its first seven years, as listed in Volume One of the Annals, indicates that at least 70 out of 193 papers were concerned primarily with geomorphology. Actually there are more geomorphologists in the United States today than fifty years ago. However, today only 4 per cent of the geographers of the United States consider geomorphology their first field of specialization; only 3 per cent the second field of interest (see Table XII).

47 Richard Joel Russell, "Geographical Geomorphology", Annals of The Association of American Geographers, Vol. 39 (1949), pp. 1-11.

48 Louis C. Peltier, "Geomorphology", in American Geography: . . . op. cit., pp. 362-380; quote from page 376.

cations of landforms are moving in the right direction - the direction of a geographical geomorphology.

Dissertations in Other Aspects of Geography

From 1952 - 1957 inclusive, dissertations in this fifth main category constitute about 10 per cent of all theses for the period.

Dissertations here classed as geography in education make up nearly 50 per cent of those in this main category and nearly 5 per cent of all dissertations. Although these dissertations vary considerably, they may be grouped logically as follows: (1) five deal with the professional subject matter for courses in geography of a country, state, or area; (2) seven are studies of geography courses (offerings) on various levels and for various purposes in colleges and universities, mostly in the United States or parts of it; and (3) two analyze the contributions of a person or a group to geography. These theses were written in five departments, one school having ten of them. Except for one, all were written for the Doctor of Education degrees.

The dissertations classified here as dealing primarily with techniques comprise 31 per cent of those in this main category and nearly 3 per cent of all theses for the period. Two of these deal with cartographic techniques; three with statistical methods; two with photointerpretation; and one with field methods. In view of the large number of cartographers in the United States,[49] of the great progress that is being made in some of these techniques and of the continued active demand for persons with such training it is surprising that more doctoral candidates have not chosen to produce dissertations in them.[50] However, only a few departments of geography give more than elementary work in cartography, and even fewer give much work in photointerpretation.

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49 Nearly nine per cent of the geographers in the United States consider cartography and map intelligence as their first field of specialization; five per cent the second field of interest (see Table XII).

50 Cartographer: John C. Sherman and Waldo R. Tobler, "Multiple Use Concept in Cartography," The Professional Geographer, Vol. IX (September 1957), pp. 2-5; Robert E. Cramer, "Cartography at the Aeronautical Chart and Information Center," The Professional Geographer, Vol. VIII (November 1956), pp. 7-9; Meredith F. Burrill, "Quickie Cartograms," The Professional Geographer, Vol. VII (November 1955), pp. 6-7; Edwin N. Thomas, "Balanced Colors for Use on the Multicolor Dot Map," The Professional Geographer, Vol. VII (November 1955), pp. 8-10; J. Ross Mackay, "Percentage Isopleth Maps," The Professional Geographer, Vol. VII (November 1955), pp. 10-11; Arthur H. Robinson,

The six dissertations in the "other" subcategory of this main group deal with the geography of recreation of particular areas and with geography and planning.

General Locale of Dissertation Studies Within the United States

Dissertations dealing with a locale within the United States or with the United States as a whole from 1952 to 1957 inclusive make up to 60 per cent of all dissertations for the period. Each year during this period they comprise from 51 per cent to 66 per cent of all dissertations (Table VIII). Most of the dissertations in the last two subcategories in this table deal with geography in education and techniques, and cannot be classified as to locale. One might expect that departments of geography within a given sub-area of the United States, as designated by the Bureau of the Census, would have produced a large percentage of the dissertations with a locale in that sub-area. The locale of about 70 per cent of the theses on the United States is in the sub-areas in which the departments that produced them are located. However, the percentage varies considerably from one sub-area to another.

In five of the sub-areas of the United States the departments of geography within those sub-areas account for a large proportion of the dissertations concerned with them. Among these

50 (Cont.)

"Geographical Cartography," in American Geography: . . . op. cit., pp. 553-557; George F. Jenks, "Pointillism as a Cartography Technique," The Professional Geographer, Vol. V. (September 1953), pp. 4-6; Allen K. Philbrick, "Toward a Unity of Cartographical Forms and Geographical Content," The Professional Geographer, Vol. V (September 1953), pp. 11-15; J. Ross Mackay, "The Alternative Choice in Isopleth Interpolation," The Professional Geographer, Vol. V (July 1953), pp. 2-4; "Cartography Panel," The Professional Geographer, Vol. IV (September 1952), pp. 2-18; Arthur H. Robinson, The Look of Maps, the University of Wisconsin Press, Madison, 1952, pp. XI and 105; "Cartography Issue," The Professional Geographer, Vol. III (September 1951), pp. 1-36; Robert J. Voskuil, "Cartographers in Government," The Professional Geographer, Vol. II (June, 1950), pp. 29-32; Erwin Raisz, "Cartography Round Table," The Professional Geographer, Vol. II (November, 1950), pp. 9-24.

Photointerpretation: Harriet Ruth Long, "A Geographer's Role in Aerial Photointerpretation," The Professional Geographer, Vol. VI (December 1947), pp. 23-28; Captain Robert B. Monier and Lieutenant Norman E. Green, "Aerial Photographic Interpretation and the Human Geography of the City," The Professional Geographer, Vol. IX (September 1957), pp. 2-5; Hibberd V. B. Kline, Jr., The Interpretation of Air Photographs," in American Geography: . . . op. cit., pp. 530-546.

Table VIII

General Locale of Dissertation Studies Within the United States 1952 to 1957 (1)

General Locale (2)	1952	1953	1954	1955	1956	1957	Total	Percentage of Category (3)
East North Central	10	10	5	5	4	4	38	24.0
Middle Atlantic	2	3	4	4	4	5	22	13.9
Pacific	4	4	2	3	5	2	20	12.7
New England	1	1	4	4	3	3	16	10.2
South Atlantic	2	1	2	2	7	1	15	9.4
Mountain	3	3	3	-	-	5	14	8.9
West North Central	1	4	1	2	2	4	14	8.9
West South Central	1	1	3	3	4	-	12	7.6
East South Central	-	-	2	3	2	-	7	4.4
U. S. as a Whole	4	1	-	4	1	3	13	
Not Classifiable by Locale	-	-	1	2	3	5	11	
Totals	28	28	27	32	35	32	182	
Percentage of all Dissertations	66	62	51	56	64	60	60	

(1) Compiled from listings of titles of dissertations in various issues of The Professional Geographer, and checked with schools awarding degrees each year in Directory of College Geography in the United States, Volumes V to IX.

(2) The "general locale" areas here used are the "geographic divisions" of the United States as formerly used by the Bureau of the Census.

(3) These percentages are based on only those dissertations that could be assigned a definite locale within the United States - 158 in all.

various sub-areas of the United States, 24 per cent of the dissertations with a sub-area locale have an East North Central locale - Illinois, Indiana, Michigan, Ohio and Wisconsin. Seven departments (Northwestern University, University of Illinois, Ohio State University, University of Chicago, University of Wisconsin, University of Michigan, and Indiana University in the order of numbers of completed dissertations for the period) produced nearly all the theses with this sub-area as a locale. The high rank of this area is due in large part to its seven strong departments. In the Middle Atlantic sub-area - New Jersey, New York and Pennsylvania - had for the period nearly 14 per cent of the dissertations, classified according to sub-areas in the United States. However, four departments (Syracuse University, Pennsylvania State University, Columbia University, and Teachers College, Columbia University) in this sub-area produced only twelve of the twenty-two which had this area as their locale. In the Pacific sub-area the University of Washington, University of California at Berkeley, and University of California at Los Angeles (the University Of Washington twice as many as the other two combined) produced fifteen of the twenty dissertations with this sub-area as their locale. In New England, Clark University (8) and Harvard University (3) produced eleven of the sixteen theses of the area. In the West South Central sub-area -- Arkansas, Louisiana, Oklahoma and Texas -- Louisiana State University accounted for ten of the twelve dissertations on this area.

In contrast to the above, universities within the other four sub-areas produced only 26 per cent of the theses on those areas -- Mountain, one university, one dissertation out of fourteen; West North Central, four universities, four theses out of fourteen for the area; South Atlantic, three departments, five theses out of fifteen on the area; East South Central, two departments, three dissertations out of seven on the area.

Areas of Dissertation Studies Outside Continental United States

In 1952 to 1957 the dissertations written on areas outside continental United States make up 40 per cent of all dissertations (Table IX). Although the number of dissertations on non-United States areas in this period is the same as that for the period prior to 1952, the percentage of all theses for this period is twice that for the former period. By years in this period dissertations on non-United States areas varied from 40 per cent to 49 per cent of the total. The relatively high rank of dissertations on non-United States areas is due to the several conditions as pointed out in the first part of this report, pages 3 to 5. Of major importance is the large number of pre-doctoral fellowships available for field

Table IX

Areas of Dissertation Studies Outside the Continental United States 1952 to 1957 (1)

Areas	1952	1953	1954	1955	1956	1957	Total	Percentage of Total
Asia	2	4	9	10	7	6	38	30.9
Caribbean America	4	5	4	3	2	3	21	17.0
Europe	-	2	4	4	3	4	17	14.0
South America	1	1	5	3	3	1	14	11.3
Canada-Alaska	-	2	2	2	2	3	11	9.0
Africa	2	-	2	2	2	1	9	7.3
Australasia	3	1	-	1	1	1	7	5.7
USSR	-	2	-	-	-	1	3	2.4
Others	2	-	-	-	-	1	3	2.4
Totals	14	17	26	25	20	21	123	
Percentage of all Dissertations	34	38	49	44	36	40	40	

(1) Compiled from listings of dissertations in various issues of The Professional Geographer, and checked with schools awarding degrees each year in the Directory of College Geography in the United States, Volumes V to IX.

work and research in foreign areas[51] and the number of departments offering doctoral research in foreign areas. In this period twenty-three departments granted a total of 123 doctorate degrees on non-United States areas.

Of the dissertations on non-United States areas those on Asia (not including those on the USSR) account for nearly 31 per cent. The number on Asia in this period is nearly twice that prior to 1952 -- percentagewise 31 as against nearly 15. The high rank of Asia in non-United States theses for the period 1952 to 1957 is due not only to the continued international stresses in various parts of Asia but also to the fact that seventeen departments contributed doctoral dissertations on Asia. Universities producing two or more were Clark (6), Syracuse (5), Teachers College, Columbia (5), Michigan (4), Northwestern (3), Indiana (2), Johns Hopkins (2), and Maryland (2). The theses on Asia are roughly equally divided between eastern, southern and western Asia.

Dissertations on Latin America (Caribbean America and South America combined) comprise 28 per cent of those on foreign areas for the period. Almost as many theses on Latin America were produced in this period as in the period prior to 1952. Thus, the interest in doctoral research in geography of Latin America has increased notably.[52] In the period under consideration fifteen departments contributed dissertations on Latin American geography. Universities with two or more are California at Berkeley (7), Northwestern (5), Chicago (4), Syracuse (4), Clark (2), Illinois (2), Johns Hopkins (2), and Wisconsin (2).[53] For the locale of dissertations on Latin America see the Appendix.

From 1952 to 1957 about 14 per cent of the dissertations on non-United States area were on Europe. Those on Europe held rougly the same position as they did prior to 1952, although seven

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51 Donald Patton and Walter Deshler, "International Fellowships and Research Grants", The Professional Geographer, Vol. VIII (November 1956), pp. 18-23; and Donald Patton, "International Fellowships and Research Funds", The Professional Geographer, Vol. VI (July 1954), pp. 12-21.

52 The number of dissertations on Latin America is due in part at least to the number of United States geographers with special interest in that area. Of the United States geographers who consider regional geography their first specialty, 25 per cent give Latin America as their first field of specialization (see Table XII).

53 For the interest of our Latin American colleagues the universities that contributed one dissertation each are Iowa, California at Los Angeles, Maryland, Michigan, Minnesota, Nebraska and Ohio.

more theses were written on Europe in the earlier period. Nine departments of geography contributed the seventeen dissertations on Europe in 1952 to 1957. The universities with two or more are Clark (5), Northwestern (3), Syracuse (2), and Washington (2).

Dissertations on Canada-Alaska comprise only 9 per cent of those in 1952-1957 on foreign areas, as against nearly 22 per cent of those prior to 1952. Two universities contributed two each, Clark and Michigan, and seven accounted for one each.

There seems to be an increasing interest on Africa for in 1952-1957 the theses on Africa make up 7.3 per cent of those on non-United States areas, as against only three dissertations on Africa prior to 1952. In the period, 1952 to 1957, nine universities contributed one dissertation each on Africa.

As many dissertations were written on Australia in 1952 to 1957 as prior to that time, yet those on this area comprise only 5.7 per cent of those in 1952 to 1957 on foreign areas. Five universities contributed all of these, Washington (3), and four others one each.

Only three dissertations were written on the geography of the USSR, 1952 to 1957. Columbia, Iowa and Washington universities each contributed one. Despite the great attention focussed on the USSR since World War II the small number of dissertations on this nation is probably due to the difficulties and expense of doing field work and research in the USSR. Most departments of geography require field work and research for the majority of their doctoral dissertations.

Universities Awarding Doctorates from 1952 to 1957

Most of the departments of geography that awarded Doctor's degrees in this period are shown year by year in Table X. Roughly one-half of the departments with programs of work for the doctorate awarded the doctorate in each of these years. Although the number of degrees awarded by most of the universities varied considerably from year to year, twelve departments each with more than ten doctorates for the period, contributed nearly 76 per cent of all Doctor's degrees in geography. Naturally, these departments have advanced graduate programs not only in at least two-thirds of the topical aspects of geography, but also in at least three of the seven major area divisions of the earth. Also, all of them except one have had programs of advanced geographic work for more than twenty years. These same twelve departments also contributed for the period 76 per cent of the dissertations on non-United States areas. In three of them -- Clark, Northwestern and Michigan -- half of the dissertations completed are on foreign areas; in California at Berkeley nine out of sixteen; in Syracuse twelve out of eighteen.

Table X

Doctorates (Ph. D. and Ed. D.) in Geography by Universities 1952 to 1957 (1)

University (2)	1952	1953	1954	1955	1956	1957	Total
Clark University	6	4	7	6	6	7	36
Northwestern University	4	7	4	6	-	3	24
University of Chicago	7	5	2	2	4	3	23
University of Washington	6	1	5	3	3	3	21
University of Michigan	1	3	-	5	5	4	18
Syracuse University	1	3	3	7	1	3	18
Teachers College, Columbia University	1	3	5	3	2	4	18
University of California, Berkeley	1	4	4	1	3	3	16
Ohio State University	2	4	1	3	6	-	16
University of Wisconsin	2	1	2	3	5	1	14
University of Illinois	2	1	3	2	1	5	14
Louisiana State University	1	-	4	3	5	-	13
University of Maryland	3	1	-	1	1	3	9
University of Nebraska	-	-	3	3	1	1	8
University of California, Los Angeles	-	1	2	2	2	1	7
Harvard University	-	1	2	1	1	2	7
Johns Hopkins University	2	-	2	1	-	2	7
State University of Iowa	1	2	1	1	1	-	6
Indiana University	-	1	-	2	2	-	5
Pennsylvania State University	-	1	1	-	-	2	4
Columbia University	-	1	-	-	1	1	3
University of Minnesota	-	-	-	-	1	2	3
University of North Carolina	-	-	1	-	1	1	3
Ten other universities	2	1	1	2	3	3	12
Totals	42	45	53	57	55	53	305

(1) Compiled from the listings of titles of dissertations in various issues of The Professional Geographer and checked with schools awarding degrees each year in the Directory of College Geography in the United States, Volumes V to IX.

(2) These figures may not be entirely complete, but not many dissertations completed and degrees awarded were unreported in these publications.

Employment of Geographers in the Academic Field

Although exact statistics are not available to the writer, it is estimated from the materials at hand[54] that prior to 1940 about 90 per cent (perhaps more) of the geographers in the United States were employed in the academic field, at the university, collegiate, secondary, and primary levels.[55] Up to that time few geographers found outlets for their services in government (federal, state and city) and in business. "The well-known prewar situation, in which members of the profession found virtually sole outlet for their services in academic fields, changed abruptly in 1942 and succeeding years, when government and military demands

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54 "Status of Professional Geographers in the United States in December 1943," Bulletin of the American Society for Professional Geographers, Vol. 2, Number 2, May 1944; George F. Deasy, "Training, Professional Work, and Military Experience of Geographers, 1942-1947," Bulletin of the American Society for Professional Geographers, Vol. 6 (December 1947), pp. 1-14; George F. Deasy, "War-time Changes in the Occupation of Geographers," Bulletin of the American Society for Professional Geographers, Vol. 7 (April 1948), pp. 33-42.

55 Although between the two world wars there was a rapid development of geography in colleges and universities in the United States, the Washington D. C. area did not share in this trend. In the one city of the United States, where its population is most concerned in its day-to-day work with the of higher learning gave such matters little attention in contrast to many institutions in the various states. In the whole Washington area in the 1940's only one institution of higher learning -- the District of Columbia Teachers College -- had a department of geography and gave geography to its many undergraduates, but it did not offer graduate work. As a result of the frantic efforts of official Washington during World War II to become adequately informed on many parts of the world, the local institutions recognized the value of geography. In 1957 all the colleges and universities of the District of Columbia (eight of them) had 28 full-time geography instructors and an enrollment in geography courses of 2,300; to these should be added nearby University of Maryland, at College Park, just outside the District, with a new major department of 14 full-time geography instructors and an enrollment of nearly 1,900 -- Directory of College Geography . . . op. cit., Vol. IX (April 1958), pp. 17 and 26.

for manpower trained in the geographic discipline resulted in an unprecedented shift to non-academic fields. . . . Two out of every five geographers during those years (1942-1945) were drawn into government employ, either in or out of uniform."[56] "Government employment reached a peak in 1945 when perhaps 500 were on the federal payroll."[57] By 1947 perhaps half of the former government geographers had resumed academic work.

According to the Directory of the Members and Associates of the Association of American Geographers, in early 1952 about 62.2 per cent of those members, for whom employment data were given, were engaged in academic work -- 45.8 in university teaching, 10.2 students (mostly graduate students), and 6.2 in secondary school teaching.[58] The percentages used here are for those members for whom employment data were given in the Directory - a total of 1335. Employment data were unknown for 362 members. These percentages, based on those for whom data were available, are more accurate for the actual employment situation than if they were based on the total membership, but even these figures are incomplete. There were 832 members, according to the Directory, engaged in academic work in 1952. Actually this number is somewhat less than half of the full-time instructors in geography in colleges and universities in the United States in 1952 (see Table V); 1718 full-time geography instructors as against 1697 members of AAG listed in the Directory.

In early 1956 nearly 64 per cent of the 1730 members of the Association of American Geographers, for whom employment data are given in the Handbook-Directory,[59] or are known by this writer, were in academic work -- 45.8 per cent in college and

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56 George F. Deasy, loc. cit., Vol. 6 (December 1947), p. 4.

57 George F. Deasy, op. cit., Vol. 7 (April 1948), p. 36.

58 Arch C. Gerlach (Editor), "Directory of the Members and Associates of the Association of American Geographers," The Professional Geographer, Vol. IV (May 1952), pp. 1-52; and Louis Peltier, "Analysis of the Membership of the Association of American Geographers," The Professional Geographer, Vol. IV (July 1952), pp. 2-4.

59 Handbook-Directory 1956, The Association of American Geographers, Washington, D. C., pp. 45-164. The figures used here were compiled from the personal listings in the Handbook-Directory. A total of 1911 members were listed, but employment data are given, or are known by the writer, for only 1730 members.

university teaching and research, 12.7 students (mostly graduate student Associate Members of AAG), 2 per cent in junior college and high school teaching, and 1.3 in school administration (Table XI).[60] Actually many more geographers than those shown in Table XI are employed in the academic field, because in 1957 there were 2101 full-time instructors in geography in the United States (see Table V) -- 2101 as against a total of 1911 members of AAG --, and in 1957 78 departments had enrolled 949 candidates for advanced degrees.[61]

The opportunities for employment of trained geographers in colleges and universities continues to expand. In nearly every year since the late 1940's the demand has exceeded the number completing the training in geography. In four years 1953 to 1956 inclusive the Placement Committee of AAG received about 160 calls for teachers of geography in colleges and universities. Several of the leading departments each year in this period received from 30 to 60 or more calls for teachers. Although administrations wrote to more than one department to secure teachers of geography, a conservative estimate of the openings in colleges and universities to be filled each year would appear to be at least 80. Despite the fact that an average of thirty schools each year for the period 1952 to 1957 inclusive added geography to their curricula, it is known that a large number of these positions went unfilled; others were occupied by inadequately trained persons -- some by masters in geography instead of Ph. D.'s; some by bachelor's instead of master's; some by persons with

60 Further evidence of the opportunities of employment in the academic field are the following: of 415 majors in geography from 54 departments placed in 1953-54 35.7 per cent went into primary and secondary school teaching and 28.7 per cent entered upon graduate work. Of 171 masters in geography from 26 departments placed in 1953-54 universities-colleges-teachers colleges-junior colleges employed 15.8 per cent, primary and secondary schools 15.2 per cent, and 25.7 per cent entered graduate schools. Of 89 doctorates in geography from three departments in 1940-41, five departments in 1948-49, and eleven departments in 1953-54, universities employed 42.7 per cent, colleges 25.8, teachers colleges 13.5, and junior colleges 2.2 per cent -- 84.2 per cent in academic institutions. Joseph A. Russell, "Trends in Placement and Training of American Geographers," The Professional Geographer, Vol. X (May 1958), pp. 32-36.

61 Only the equivalent of about 23 per cent of these were Associate Members of the Association of American Geographers.

Table XI

Employment of the Members of the Association of American Geographers 1956 (1)

Types of Employment (2)	Numbers (2)		Percentage of Total	
1. Academic Field	1102		63.7	
College and University Teaching and Research (3)		793		45.8
Students(mostly graduate student Associate Members of AAG)		220		12.7
Junior College and High School Teaching		35		2.0
Public School Teaching		32		1.9
Academic Administrators (4)		22		1.3
2. Government (5)	431		25.0	
3. Business (5)	197		11.3	
Totals	1730		100.0	
4. Members for whom occupations are not given, or are not known by this writer.	181			
Total	1911			

(1) The numbers in the occupational categories are based upon data in the Handbook-Directory 1956, The Association of American Geographers, Washington, D. C., and also upon those known by the writer.

(2) Actually, the figures of employment in most of these categories, if not all of them, are too low.

(3) Less than 20 of these persons are engaged in full-time research.

(4) Does not include departmental chairmen.

(5) See Table XIII for breakdown of employment in Government and Business.

advanced degrees in other disciplines on a half-time to full-time basis for a few introductory courses in geography. These facts mean that schools are not getting the geographical skills they need at several levels.

Expanding enrollments in colleges and universities are creating many new jobs for geography teachers. This is true not only at the level of instructor and assistant professor, but also at the higher professional ranks. The salaries offered in recent years show an increase over former salaries of from $500 to $2,000 for the various ranks. To qualify for many of these positions the candidates must have the doctorate, or most of the requirements for it completed. One of the difficulties the leading departments have is to keep the good doctoral candidates from accepting appointments before they complete the requirements for the degree. Several departments have from 15 to 25 candidates who after completing all requirements except the dissertation accepted appointments and are now struggling to complete the dissertation while serving in full-time teaching positions.

All things seem to indicate a continued growth in the opportunities to teach geography in colleges and universities in the United States. "Even if geography were to do no more than maintain its present relative position in the colleges we might expect something like a 50- to 75-per-cent increase in the number of college positions (in geography) in the next decade. There has been, however, a much more rapid advance in the position of geography in colleges in the last decade than in the general undergraduate registrations."[62] If there should be only a 50-per-cent increase, that would mean 100 or more new positions per year for the next ten years for geographers in colleges and universities.

Special Fields of Interest of Geographers of the United States

At a regular meeting of the NAS-NRC Advisory Committee to the Department of State members of the Committee in discussing the nature of "The United States National Report" suggested that our Latin American colleagues might be interested in the fields of specialization of the geographers of the United States. Although data on the special fields of interest on all geographers of the United States are not available, such data as are available in the Handbook-Directory, 1956, of The Association of American Geographers have been compiled and are presented in Table XII. The data are available for only 67 per cent of the members listed in the Handbook-Directory, but this number can certainly be considered a generous sample for the entire membership.

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62 Andrew H. Clark, "Careers for Geographers in Higher Education," The Professional Geographer, Vol. VI (May 1954), pp. 19-28, quote from page 27.

Of the 1,282 members for whom such data are available, 25 per cent consider the geography of a major segment of the earth's surface -- "regional" geography -- as their first field of specialization (see Table XII for the number who give regional geography as their second and third fields of specialization). It is interesting to note that (1) of all the major areas of the earth Latin America has more geographers in the United States with this area as their first special interest than any other area, (2) North America is a close second, (3) Asia -- not including the USSR -- falls considerably below these two, and (4) all other areas are far below Asia in the number of United States geographers who consider such areas as their first field of specialization.

Nearly 23 per cent of United States geographers consider general economic geography or some aspect of it as their first field of specialization. General economic geography accounts for 42 per cent of these; the geography of and conservation of natural resources, and industrial geography each account for roughly 17 per cent. Other aspects of economic geography fall far below the ones specified above. Transportation geography and especially marketing geography are relatively new, but the other two were among the first aspects of economic geography to be developed by geographers in the United States.

A little more than 15 per cent of United States geographers consider urban-political-historical-settlement-population geography as a group their first field of special interest. Urban (36 per cent), political (28 per cent), and historical (19 per cent) geography account for 83 per cent of the persons in this group.

The other three major groups - physical geography, techniques and other aspects of geography have nearly 37 per cent of United States geographers who consider physical geography or some discipline their chief field of interest. Fourteen per cent of United States geographers consider physical geography or some aspect of it as their first field of specialization. The three important aspects of the discipline in this group are geomorphology, climatology and general physical geography. In the other two groups only cartography and map intelligence and educational geography have a relatively large number of specialists. Compare the number of specialists in cartography and map intelligence with those in any of the other subcategories of the discipline.

Publications and Research Projects of the Geography Staffs of Colleges and Universities

These two very significant aspects of geography in the academic field in the United States are not being covered in this respect. However, it may be pointed out that a large proportion of the staff members in all of the larger departments and even in some of the smaller ones is actively engaged in research and

Table XII

Special Fields of Interest of Geographers as Reported in the Handbook-Directory 1956 (1)

Fields of Interest	Number of First Interest		Number of Second Interest		Number of Third Interest	
1. Regional Geography						
Latin America	82		49		37	
Latin America General		59		35		19
Middle America		15		6		12
South America		8		8		6
North America	73		100		84	
Anglo America		64		91		78
Canada		9		9		6
Asia (not including USSR)	55		51		52	
General Regional Geography	30		18		9	
Europe	25		40		33	
Africa	14		13		17	
USSR	14		12		13	
Arctic Geography	12		10		14	
Arid Lands	6		7		7	
Tropical Geography	5		4		4	
Mountain Geography	3		1		-	
Australia and New Zealand	2		6		4	
Geography of Oceans	2		2		1	
Totals	323		303		275	
Percentage of total	25		28		33.3	
2. Economic Geography						
General Economic Geography	124		122		59	
Geography and Conservation of Natural Resources	55		47		47	
Conservation and Management	29		27		33	
Geography of Natural Resources	15		9		9	
Geography of Water Resources	11		11		5	
Industrial Geography	50		28		20	
Industrial Geography and Geography of Manufacturing	34		16		13	
Industrial Location and Development	16		12		7	
Agricultural Geography	26		27		12	
Transportation Geography	16		19		19	
Land Utilization	13		17		16	
Marketing Geography	10		5		2	
Totals	294		265		175	
Percentage of total	22.9		24.5		21.1	
3. Urban-Political-Historical Settlement-and-Population Geography						
Urban Geography	70		50		32	
Political Geography	55		57		24	
Historical Geography	38		44		37	
Settlement Geography	18		8		8	
Population Geography	15		19		17	
Totals	196		178		118	
Percentage of total	15.3		16.5		14.3	

Table XII (continued)

Fields of Interest	Number of First Interest	Number of Second Interest	Number of Third Interest
4. Physical Geography			
Geomorphology	54	33	32
Climatology	53	40	36
Physical Geography-General	34	41	16
Biogeography	15 (2)	12	8
Soils Geography	12	7	3
Geology	12	6	3
Totals	180	139	98
Percentage of total	14	12.9	11.9
5. Techniques			
Cartography and Map Intelligence	101	59	52
Photointerpretation and Photogrammetry	12	29	20
Field Methods	3	8(3)	17(3)
Totals	116	96	89
Percentage of total	9.2	8.9	10.8
6. Other Aspects of Geography			
Educational Geography	56	23	31
Human Geography	24	11	7
Military Geography	22	21	6
City and Regional Planning	21	10	14
Cultural Geography	20	15	7
Typonomy	8	6	-
Principles or Elements of Geography	7	3	1
Medical Geography	4	3	3
Mathematical Geography	1	-	-
Others (4)	10	8	2
Totals	173	100	71
Percentage of total	13.5	9.2	8.6
Grand totals	1,282	1,081(5)	826(6)

(1) Compiled from the Handbook-Directory, 1956, The Association of American Geographers, Washington, D. C., pp. 45-164.

(2) Thirteen of these gave plant geography as their first specialty.

(3) Includes five who gave methodology and three who gave philosophy of geography as second and third specialty.

(4) Includes statistics, administration, nutrition, library science, audio materials and geography of religions.

(5) This total is smaller than the total in column one because 201 geographers gave only one specialty.

(6) This total is smaller than that in column one because 456 geographers did not give a third specialty.

publication. The administrators in many of the colleges and universities in considering promotions in rank and increases in salaries place much emphasis on research and publication. Between 1952 and 1957 hundreds of books and articles have been written by academic geographers. Most of these publications are listed in standard reference sources, such as (1) Current Geographical Publications: Additions to the Research Catalogue of the American Geographical Society, published monthly, except July and August, by the American Geographical Society of New York; (2) Handbook of Latin American Studies, published annually by the University of Florida Press, Gainesville; (3) Monthly Catalogue of United States Government Publications, published monthly by the United States Government Printing Office, Washington, D. C.; (4) International Index: A Guide to Periodical Literature in the Social Sciences and Humanities, published quarterly by the H. W. Wilson Company, New York; and (5) Readers Guide to Periodical Literature, published bi-weekly from September to June and monthly in July and August by the H. W. Wilson Company, New York. Also, lists of publications and research projects of professional geographers in colleges and universities may be found in the Directory of College Geography of the United States (annual), Department of Geography, University of Kentucky, Lexington. The leading periodicals[63] which publish geographical articles in the United States are The Geographical Review (quarterly), The American Geographical Society of New York; Economic Geography (quarterly), Clark University, Worcester, Massachusetts; Annals of The Association of American Geographers (quarterly); and The Professional Geographer (bi-monthly), The Association of American Geographers, Washington, D. C.; The Journal of Geography (monthly except June, July and August), Official Organ of the National Council of Geographic Education, A. J. Nystrom and Company, Chicago; and The National Geographic Magazine (monthly), The National Geographic Society, Washington, D. C. Of course, many geographical articles by United States geographers are published in several other periodicals in the United States and also in those in foreign countries.

PART II GEOGRAPHY IN GOVERNMENT

Introduction

In the federal government geography is old, as old as the government itself. Early explorations, surveys, reports, maps and charts were all an integral part of the occupations of new lands

63 See Albert C. Gerould and Henry J. Warman, "Most Cited Periodicals in Geography," The Professional Geographer, Vol. VI (March 1954), p. 6-12.

of the then expanding United States -- all "a practical necessity to the expanding function of government."[64] About a dozen men "were among the practicing government geographers of the earlier period who loom large . . . . Those persons doing geographic work during the first century of the Republic were in most part classified officially under some other title."[65] Even as late as 1894 in all the federal government departments and agencies there were only two geography positions, specifically named as such.[66] During World War I approximately twenty outstanding professional geographers were brought to Washington for work in the Shipping Board, War Trade Board and the Armed Forces, but most of them returned to their university posts after the War. However, a few aided in the preparations for and served as advisors at the Paris Peace Conference. Meanwhile, a small group of professional geographers, presumably not more than twenty in government service was making outstanding contributions on various aspects of land, soil, climate, vegetation, agriculture, and population of the United States.

In the depression years of the 1930's considerable expansion of geographical work on resources and planning took place in the federal service, particularly in the Tennessee Valley Authority, the Soil Conservation Service, the Reclamation Service, the National Resources Planning Board, the Mississippi Valley Board, and the Resettlement Administration. However, only in the first two did considerable groups of professional geographers develop, and from these the geographers were largely dispersed before the end of that decade.

As pointed out above, not more than ten per cent of the professional geographers of the United States were employed in government service prior to 1940. Following 1940 large numbers of professional geographers were recruited for work in strategic and tactical intelligence, area analysis, topical research, in map design, drafting and production, and also in various service training programs. Apparently more geographers were employed in ASTP Basic Training courses than any other similar program. The Air Force Training Program ranked next, followed by ASTP-Area Language Program, Navy V Program, the Civil Affairs

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64 John Kerr Rose, "Geography in Practice in the Federal Government, Washington," in Griffith Taylor (Editor), Geography in the 20th Century, Second Edition, Philosophical Library, New York, 1957, pp. 566-587; reference on page 566.

65 Ibid, p. 566.

66 Ibid, p. 566.

Program, and miscellaneous military groups.[67] Between 1942-1945 two out of every five geographers were drawn into government employ, either in or out of uniform.[68] As of December 1944, some 293 civilian geographers were employed by the federal government and an additional 265 were in uniform, either in the field or in government offices.[69] By 1947 about one-half of the civilian geographers employed by the federal government had returned to their former positions and more than two-thirds of those in uniform returned to civilian pursuits, the majority to academic posts, but a large number of military personnel released by the Army and Navy entered federal government employment. Many of the younger geographers both in and out of the military had no attractive academic position to which to return and government salaries were equally attractive to them, if not more so. Furthermore in the government position many of them could continue at the same type of work in which they had been engaged during the war. What they were capable of doing had become well known to government officials. Although the principal war-time agencies employing geographers were abolished after the war, other departments and agencies took considerable numbers of geographers and greatly expanded their geographic work.

Of major professional interest is the fact that so many geographers remained in Washington in the immediate post-war period. "A Survey made in December 1947 showed the number to be approximately 200."[70] Some continued to leave Washington, but the number in the federal service probably did not drop much, if any, below 200, because others entered government employment. Figures on the number of geographers in federal government service for the period 1947 to 1952 are not available to this writer. However, early in 1952, when the "Directory of the Association of American Geographers" was published[71] at least 319, or 18.8 per cent of the members of the Association of American Geographers, were employed by the federal government.[72]

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67 George F. Deasy, "Training, Professional Work, and Military Experience of Geographers, 1942-1947," Bulletin of the American Society of Professional Geographers, Vol. 5 (December 1947), pp. 1-14; reference on page 4.

68 Ibid, p. 5.

69 John Kerr Rose, "Geography in Practice. . . ", op. cit., p. 570.

70 John Kerr Rose, op. cit., p. 572.

71 Arch C. Gerlach, "Directory of the Association of American Geographers," The Professional Geographer, Vol. IV (May 1952), pp. 1-52.

72 Louis Peltier, "Analysis of Membership of The Association of American Geographers," The Professional Geographer, Vol. IV (July 1952), pp. 2-3.

Most likely the above number is too low because occupational data were not given in the Directory for 21.3 per cent of the members. Furthermore, as of December 1953, there were 330 members of AAG in Washington;[73] most of these were in government and not all professional geographers in the federal service were members of AAG.

Early in 1956 at least 431, or 25 per cent, of the members of the Association of American Geographers were employed in government agencies, whether federal, international, state or municipal (Table XIII). Actually, the number of professional geographers engaged in government work is nearly 600, perhaps more, because the above information is based on 1730 members, whereas the membership in May 1956 was at least 1911 and in May 1957 it was 1950;[74] and quite a few professional geographers employed by government are not members of AAG.

Of the geographers engaged in government work at least 23 per cent are employed in federal departments and agencies. It is estimated that about half of the geographers in Washington devote their efforts to map making,[75] map intelligence, or map information distribution. Roughly the other half is engaged in research, intelligence or report writing, although some are primarily administrators, coordinators, or consultants. In the employment of geographers the Department of Defense - Army, Air Force, and Navy - leads by far with well over 200. These three services use large numbers of geographers in intelligence investigation and evaluation, research for development requirements and map making and map intelligence. The sections of the

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73 Herman R. Friis, "The Distribution of Members of the Association of American Geographers and of the Middle Atlantic Division, December 1953: A Cartographic Presentation," The Professional Geogeapher, Vol. VI (September 1954), pp. 6-14; reference page 10.

74 The Professional Geographer, Vol. IX (May 1957), p. 17; see also, A Career in Geography, Committee on Careers in Geography, National Research Council and Association of American Geographers, 1954, Washington, D. C., p. 11; and John Kerr Rose, "Opportunities for Geographers in Government Service," The Professional Geographer, Vol. VI (May 1954), pp. 1-6. This writer knows personally nearly 50 geographers who are employed by the federal government and who are not members of the Association of American Geographers.

75 Robert J. Voskuil, "Cartographers in Government," The Professional Geographer, Vol. II (June 1950), pp. 29-32.

Table XIII

Employment of Members of the Association of American Geographers in Government and Business 1956 (1)

Types of Employment (2)	Numbers		Percentage of Total	
1. Academic Field (3)	1,102		63.7	
2. Government	431		25.0	
Federal		386		22.4
Department of the Army (4)		109		6.3
Department of State and Executive Office of the President (5)		86		5.0
Department of the Air Force		71		4.1
Departments of Commerce and Agriculture		29		1.7
Department of the Interior		20		1.2
Department of the Navy		19		1.1
Other Departments and Agencies		52		3.0
State		23		1.3
County and City		22(6)		1.3
3. Business	197(7)		11.3	
Research Analysis, Consulting, Planning		95		5.4
Publishing (magazines, maps, books)		41		2.4
Mapping and Cartography		23		1.3
Libraries and Institutes		22		1.3
Others		16		.9
Totals	1,730		100.0	

(1) The members in the occupational categories are based upon data in the Handbook-Directory, 1956, The Association of American Geographers, Washington, D. C., and also upon those known by this writer.

(2) Actually, the figures of employment in most of these categories, if not all of them, are too low. The figure of 386 given here for the federal government is apparently too low by at least 140 -- see John Kerr Rose, "Opportunities for Geographers in Government Service, "The Professional Geographer, Vol. VI (May 1954), pp. 1-6.

(3) See Table XI for breakdown of employment in the academic field.

(4) In tabulating data from the Handbook-Directory only 35 geographers were indicated as being employed in the Army Map Service. It is known that there are at least 140 geographers in the Army Map Service.

(5) Includes the Central Intelligence Agency and Bureau of the Budget; no figures are available for the number of geographers and others employed in the Central Intelligence Agency.

(6) This figure is too low by at least 40 geographers.

(7) This figure also appears to be too low; the writer knows personally nearly 50 geographers who have the doctorate or Master's degree and are in business, but who are not members of AAG.

Department of the Army with considerable numbers of geographers are the Army Map Service,[76] the Environmental Protection Branch of the Office of the Quartermaster General, Ordnance Division, Office of the Secretary for Research and Development, and the Corps of Engineers, other than the Army Map Service. Those in the Department of the Air Force are the Aeronautical Chart and Information Center,[77] Air Weather Service, and sections dealing with intelligence research. Those in the Department of the Navy[78] are the Geography Branch of the Office of Naval Research, Hydrographic Office, and sections dealing with naval intelligence and research. Next to the Department of Defense, are the Department of State (including International Cooperation Administration, Special Advisor on Geography, Coordinator for Maps, and several geographic attaches) and the Executive Office of the President (including the Central Intelligence Agency and the Bureau of the Budget). In the Department of Commerce geographers are employed chiefly in the Area Development Division, Bureau of the Census,[79] Office of International Trade, and the Coast and Geodetic Survey. The Department of Agriculture uses most of its geographers in the Land Economics portion of the Agricultural Research Administration, Soil Conservation Service and the Foreign Agricultural Service Divisions. Most of the geographers in the Department of the

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76 Frances Hanson, "The Applied Cartography Program of the Army Map Service," The Professional Geographer, Vol. IV (July 1952), p. 14; and John Kerr Rose, Vol. VI (May 1954), op. cit., pp. 1-6.

77 "In the Editing Branch of the Cartography Division (ACIC), 54 of the 100 employees have college degrees, and 28 others have some college credit. Half of the graduates have degrees in geography, including 13 masters degrees." Robert E. Cramer, "Cartography in the Aeronautical Chart and Information Center, St. Louis," The Professional Geographer, Vol. VIII (November 1956), pp. 7-9.

78 George R. Rae, "Geography in the Navy," The Professional Geographer, Vol. IV (November 1952), p. 9; and John Kerr Rose, Vol. VI (May 1954), op. cit., pp. 1-6.

79 The number of geographers employed in the Bureau of the Census varies greatly. In 1940 only two geographers were on the Census staff. In 1950 there were 32 geographers in Census, but after work on the 1950 census was completed, the number dropped to 12. Now the Bureau is recruiting more geographers in connection with plans for the 1960 censuses of population, housing, agriculture, irrigation and drainage.

Interior are in the Office of the Secretary of the Department, Geological Survey, and the Board on Geographic Names. Elsewhere from one to several geographers are employed in the Library of Congress, Civil Defense Administration, Public Health, Archives, and Department of Justice and others.

Although Table XIII indicates that only a few geographers are employed by state, county and municipal governments, the total number thus engaged is perhaps 75 or more and the number is increasing. In state governments geographers are involved in conservation, land classification and use, highway planning, analysis of population groups and distribution, and studies of the locations of agricultural and industrial activities. Geographers employed by county and city governments are almost to a man engaged in research analysis, and in the making of maps in preparation for planning operations. "City and regional planning has, in recent years, presented geographers with an increasingly important outlet for the employment of their discipline and approach. The relationship between the geographer and the planner has become very close, "although" planning is now recognized as a specialized field." . . . "The (planning) field is wide open, and its opportunities offer a challenge to the geographer."[80]

From 1952 to 1957 the demand in government for trained geographers far exceeded the supply and there seems to be no decline in the demand, except during temporary "freezes" and intercensus periods. The demand for geographers in government generally increases each year by 100. Some of these recruits are needed to replace those leaving government service, but most of them are for unfilled or newly created positions. "A basic requirement for government jobs is a Bachelor's degree, but a Master's degree is better, and for the best positions one should have a Ph. D."[81] One should be a specialist in some topical aspect of geography, have a knowledge of cartographic procedures, and have special knowledge of some foreign area and its

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80 Harold M. Mayer, "Geographers in City and Regional Planning," The Professional Geographer, Vol. VI (May 1954), pp. 7-12; quotes from pages 7 and 12; Robert L. Wrigley, "Opportunities for Geographers in the Planning Field," The Professional Geographer, Vol. V (March 1953), p. 8; John W. Morris, "The Role of the Geographer in Social Surveys," The Professional Geographer, Vol. II (March 1950), pp. 23-27; Victor Roterus, "The Geographic Bases of Urban Planning," Bulletin of the American Society for Professional Geographers, Vol. 8 (December 1948), pp. 19-27.

81 A Career in Geography, op. cit., p. 12; and John Kerr Rose, Vol. VI (May 1954), op. cit., pp. 1-6.

language. Knowledge of the subject matter of related disciplines and of statistical methods is indispensable for certain positions.[82]

Geographic Work of Federal Government Agencies

In projecting this United States National Report to the Commission on Geography of PAIGH, the NAS-NRC Committee Advisory to the Department of State on the Commission on Geography (1) adopted a broad definition of the term "geographic" in order to cover the research and other work of many who are topical specialists, as well as regional specialists, (2) indicated a wish for the several reports to emphasize current projects and (3) outlined plans for having the reports more or less comparable in approach and in detail. The Committee realizes that much of the research and other work of professional geographers in government is to provide intelligence and other information for the day-to-day operations of various agencies and that the great bulk of this information is not made available to any one outside government. In projecting plans to secure the agency reports, the Committee enlisted Dr. Lloyd D. Black, Chairman of the AAG "Geographers in Government Service Committee" to contact and explain to persons in the various agencies what the Committee desired, and to follow through in obtaining the reports.[83] The several reports vary greatly.

Department of Agriculture

Geographic research in the Department of Agriculture is carried out on a more or less continuing basis with major attention devoted to foreign agriculture and to domestic survey programs covering agricultural land use, soils, and forest resources. These functions are carried on by a number of agencies of the Department: principally Foreign Agricultural Service, Agricultural Research Service, Soil Conservation Service and Forest Service.

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82 John Kerr Rose, "Geography in Practice . . . " op. cit., p. 585.

83 The NAS-NRC Committee and especially the writer of much of this report owe Dr. Black a special vote of thanks for the effectiveness with which he did the job entrusted to him.

Geographic Research Relating to Foreign Agriculture[84]

In recent years the geographic research of the Foreign Agricultural Service has been in the following fields:

1. Studies of the nature, extent, development and economic organization of the agricultural resources of foreign countries. These studies have covered geologic formations, soils, land uses, production, utilization, and trade in farm and related products. The geographic studies by country have been a part of larger, more comprehensive monographs on the agriculture and agricultural trade of large segments of the world.

2. In recent years the Department of Agriculture has been concerned with mounting surpluses of agricultural products in the inventories of the Commodity Credit Corporation. It has become necessary to look closely at the competitive position of United States agriculture in foreign markets. This has led to studies which have attempted to measure the competitive advantage, if any, which our major competitors have in the markets of the world. In attempting to measure competitive advantage, it has been necessary to look closely at climate, rainfall, soil resources, irrigation facilities and potentials, location, and status of agricultural technology in the major competing areas of the world. The findings have been published as numbered Foreign Agriculture Reports.

3. The Foreign Agricultural Service now has in the hands of the public printer a comprehensive monograph entitled "Agricultural Geography of Latin America." A start has been made and the pagination completed on a similar monograph for the Far East and plans have been laid for carrying this work forward to include monographs for Africa, the Middle East, and Oceania.

4. Over the years separate bulletins have been issued on seed-time and harvest dates for the major regions of the world. Plans have been laid to issue a single monograph entitled, "Seed-time and Harvest Dates for World Agriculture."

5. The geographic research of the Foreign Agricultural Service is centered in a small section which works cooperatively with the various branches and divisions of the service. The work, therefore, draws on a large corps of specialists who have intimate acquaintance with the agricultural resources, production, utilization, and trade of the countries of the world. As the various units of the Service prepare monographs for publication, the Geography Section cooperates in servicing the geographic aspects of these publications.

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[84] This section was written by Alfred I. Schwartz.

Geographic Research in the Forest Service[85]

Geographers are not employed by the Forest Service at present, but many Forest Service research publications are of value to geographic study, particularly those dealing with forest, range and watershed management and inventories.

Research, a major Forest Service activity, develops improved techniques for sustaining or increasing national timber, range and water resources, and in the process periodic resource inventories and economic studies are prepared. It is conducted in conjunction with state and local governments, private groups and other agencies of the federal government.

The importance the Forest Service attaches to research is reflected in its research budget (more than $10,000,000 in 1957) which in recent years has represented about 15 per cent of its annual appropriations.

There are four major research categories:

Forest and Range Management Research (including watershed management and recreation studies) - primarily concerned with the growing and harvesting of timber and the management and efficient use of range forage. Increasing emphases are placed on the management of both forest and range vegetation so as to produce the greatest amount of usable water and a minimum of erosion. A new recreation research program was instituted in 1957.

Forest Protection Research - conducts fire, insect, and disease studies, with a view to developing direct and indirect measures for the control of these destructive forces.

Forest Products Research - contributes to improved utilization of the forest crop through studies leading to the reduction of forest and mill wastes, the introduction of new products, and the improvement of existing products.

Forest Resources Research - includes the nationwide forest survey and economic investigations. The Forest Survey provides data by states or counties on the character and condition of forest land; the volume, quality and location of standing timber; rates of timber growth and natural losses; the amount and kind of timber cut for forest products; and the consumption of timber products and prospective requirements. Economic investigations provide data relating to the national or local production and marketing of timber and include information on the financial aspects of forest owner and operator activities.

A survey of particular interest is the Timber Resources Review (1955), an appraisal of United States timber supplies and

85 This section was prepared by James Anderson.

needs. The last similar study was published in 1945.[86]

Forest Service research programs are conducted through nine regional experiment stations and one forest products laboratory in the United States, a research center in Alaska and another in Puerto Rico. Research publications and annual bibliographies of research publications are available to the public.

For information on problems of national scope write to the Office of Information and Education, Forest Service, United States Department of Agriculture, Washington 25, D. C. Material on regional activities can be had through the respective regional research headquarters. The address and areal jurisdiction of each headquarters are indicated on the following two maps available from the Office of Information and Education, Washington, D. C.: Map showing Forest Products Laboratory and Regional Forest and Range Experiment Stations - July 1955 and Map Showing National Forests and Research Headquarters - January 1956.

Studies of Major Land Uses in the United States

The Land and Water Section, Farm Economics Research Division, Agricultural Research Service, continuously studies current land use, including patterns and trends in major uses of land in the United States, with special reference to agricultural land requirements. United States Department of Agriculture Technical Bulletin No. 1082, "Major Uses of Land in the United States," October 1953, and Agriculture Information Bulletin No. 168, January 1957, under the same title, present both distribution and trends of major land uses by means of graphs, maps, tables and analytical text.

Research is now in progress which will provide information on the economics of farmland development and alternative uses of farmland in selected areas. Both physical and economic factors are involved in the changes in land use now in progress. Field surveys are being made to obtain factual evidence of the situation. Aerial photographs are being used systematically to determine the locations and the acreages of land being shifted among major uses.

Soil Survey Activities

Soil surveys are designed to furnish soil maps and interpretations as a necessary base for all programs requiring information about soil resources. In the United States the National Cooperative Soil Survey is carried out under terms provided in written memoranda of understanding between the Soil Conservation Service in the United States Department of Agriculture and

86 "This is the most comprehensive survey ever made of the forest resources of the United States" - Lloyd D. Black.

other agencies. In most cases the cooperative agencies are agricultural experiment stations of land-grant colleges. Other federal agencies, such as the Forest Service, Bureau of Indian Affairs and Bureau of Public Roads, participate in soil surveys activities. The federal government's role in the National Cooperative Soil Survey is vested in the Soil Conservation Service. The Soil Conservation Service is charged with the responsibility of furnishing technical leadership in soil classification, standard nomenclature, and other phases of soil survey activities.

There are strong demands to complete a soil survey of the Nation in the shortest time possible. One of the objectives of the Soil Conservation Service is to make a standard soil survey of the total land area of the United States. There is urgent need to move ahead faster in completing soil surveys of the Nation not only to have a sound base for conservation plans of farms, ranches and watersheds, but also for such government programs as the Soil Bank, Great Plains Program, Rural Development Program, and other programs that require soil resource information. It has been estimated, provided adequate funds are made available, that the initial field mapping and associated field operations can be completed in approximately 15 years. An additional five years will be needed to complete and publish the soil survey maps and reports.

Only about one-fourth of the total land area of the United States is covered by adequate soil surveys for soil and water conservation planning, national soil classification, program planning and other uses. Progress in soil survey mapping is now being made at the rate of approximately 32,000,000 acres annually. This rate will need to be increased to complete the soil survey in the 15-year program. During the last two years 24 soil survey reports with maps have been published.

Because of the length of time necessary to make a standard soil survey of the Nation and the urgency of data on our soil resources, it has been decided to carry out an inventory of soil and water resources by making statistical analyses of sample areas in each county of the United States. This inventory will provide the basic facts on soil, water, and plant resources, and the problems involved in protecting and improving these resources.

One of the improvements in soil survey cartography has been the introduction of a new type of soils map. This map is on aerial photo mosaic background with soil boundaries and symbols printed in red. The scale of the majority of these maps is 1:20,000 (3.17 inches equals 1 mile) with sheets 11 1/2 by 15 inches, which when folded and bound into the report, will provide an atlas 9 1/4 inches by 11 1/2 inches. Each atlas will also contain a small-scaled colored soil association map of the area.

Soil classification is a basis for classifying, synthesizing and reporting the results of research and experience in soil science. To make optimum use of agricultural science it is essential to have a consistent world-wide soil classification scheme. Continuing efforts are being made in this direction. The 6th approximation, a new scheme of soil classification, has recently been distributed to soil scientists in foreign countries as well as to soil scientists in the United States in an effort to develop a sound soil classification system.

The physical and chemical characteristics of soils, together with crop yields under defined management levels, are being made for key soils in order to determine their position in the classification scheme, their relation to other soils, and for making better predictions regarding their response to management.

Basic studies in geomorphology, such as mapping and reconstructing buried landscape surfaces and determining the relation between these surfaces and the present soils, have given new technology in soil formation.

National Inventory of Soil and Water Conservation Needs

Basic to maintaining the productive capacity of American agriculture is a knowledge of the facts about our soil and water resources, and the human and economic factors that affect their use.

Productive land, an adequate water supply, management of plant resources, and protection of our watersheds are fundamental to a permanent agriculture and the increasing population of our Nation. Every acre of our present soil resources is becoming more valuable because of increasing demands upon it. Likewise, water problems involved in water management and utilization, flood prevention, irrigation and drainage, demand increasing attention. These are a vital part of the work of the Department of Agriculture and more particularly of those agencies of the Department engaged in soil and water resource conservation activities.

Soil and water conservation is defined as the protection, use, maintenance, and improvement of soil, water, forest, and range resources to best serve both private and public interest in providing adequate food, fiber, forest products, recreation, and wildlife now and in the future.

The Department of Agriculture has need for reliable information that will result from the making of a National Inventory of Soil and Water Conservation Needs. Such an Inventory will furnish the Department, and others, with soil and water resource data that will enable more effective planning and carrying out of responsibilities in the soil and water conservation field. The Secretary of Agriculture issued a memorandum on April 10, 1956, directing the development of a National Inventory of Soil and Water Conservation Needs. The leadership for making this inventory

is assigned to the Soil Conservation Service with the assistance of the Agricultural Conservation Program Service, Agricultural Marketing Service, Agricultural Research Service, Commodity Stabilization Service, Federal Extension Service, Farmers Home Administration, and the Forest Service.

The inventory will be useful in identifying and classifying the conservation problems and land treatment and watershed management needs. It will provide a better understanding of the conservation job that still remains to be done as of any given date. Conservation needs data will also be of considerable value in explaining budgetary requests and in making of subsequent fund distributions. A knowledge of the conservation needs will provide a practical basis for the better placement of available technical and other field personnel to assist land owners and operators with their conservation and land use problems.

The goal for initial completion of the National Inventory of Soil and Water Conservation Needs is three years, i. e., January 1, 1960. The completed inventory will be kept current to reflect important changes or trends in agriculture within the counties.

A committee on Soil and Water Conservation Needs has been organized in the Department of Agriculture with representation from the eight agencies, mentioned above. This committee is responsible for and has developed guiding policies and procedures, formulates economic assumptions, periodically makes reviews of progress, and furnishes guidance in the cooperative effort.

State Soil and Water Conservation Needs Committees are established. Their membership consists of representatives of each of the Department agencies and all state and federal agencies within the state concerned with soil, water, forest, range, and wildlife conservation and land management or use. The State Needs Committee gives guidance and supervision of this work within the state.

It is planned for the inventory to be developed by a Needs Committee in each county with supervision, assistance and cooperation furnished by the State Needs Committee. The County Needs Committee membership will consist of representatives of the various separate county agencies and groups concerned with soil and water conservation.

The inventory is to be made in each county in the United States and in the Territories and will provide basic facts about the amount and kind of soil (and related water and plant resources) and a realistic estimate of the treatment needed best to protect and improve these resources. The inventory will include two major types of estimates: (1) an inventory of land use, conservation problems, and acreage needing treatment; and (2) an inventory of watershed project needs (under authorities of Public Law 566, 83rd Congress, as amended by Public Law 1018, 84th Congress).

Basic information on land conditions will be provided from complete county coverage on representative area samples of soil surveys (land use, kinds of soil, slope and erosion) interpreted in terms of land capabilities.

Concerning the employment of geographers in the Department of Agriculture, Dr. Carleton P. Barnes has the following to say: "The Department of Agriculture employs a few geographers. This is because its functions require, at least in the judgment of those administering them, training primarily in other disciplines. At present three of its agencies, Soil Conservation Service, Foreign Agricultural Service, and Agricultural Research Service each have professional geographers. This is exclusive of cartographers supervising the map production activities of such agencies as Forest Service or Soil Conservation Service, who are employed primarily as engineers. Conversations with agencies of the Department employing geographers suggest: (1) Employment of additional geographers in the Department will depend on their having primary basic training in some other field; e. g., agricultural economics, soil science (including the necessary chemistry), cartographic engineering of photogrammetry, with geography training in addition; and (2) the number of additional positions that might be secured by geographers, having the combination of training just mentioned, is not likely to be large. Only a few employers have considered the potential contribution of persons trained in geography, and these, for the most part, have thought in terms of a few specialized jobs. For most professional positions, the geographer would have to compete primarily on the basis of his training in another discipline, and it is problematical what advantage his additional training in geography, compared to advanced work in some other discipline would give him. However, the head of the Soil Survey, Soil Classification Service, believes that it would be advantageous for his agency to employ for soil mapping and classification persons combining strong training in soil science (requirements for an undergraduate major) plus graduate work of a minor in geography, as compared to those with only the training in soil science."

Department of Commerce

Investigations in many divisions and agencies of the Department of Commerce have a distinct geographic quality. However, in most of them, such as the Weather Bureau, Coast and Geodetic Survey, Office of Foreign Trade, etc., that are in some degree concerned with geographic information, their staffs are composed predominately of technical and systematic specialists in fields of science, other than geography. In the Department investigations that utilize professional geographers and that qualify as distinctly geographical research are carried out principally in two offices -- the Office of Area Development and the Bureau of the Census.

Geographic Work of the Office of Area Development

The Office of Area Development serves as the focal point in the federal government for handling state and community requests for assistance on unemployment and on economic distress problems. The principal goal of the Office of Area Development is the improvement of economic and business conditions by furnishing technical assistance directed to (1) expanding and strengthening existing industries, (2) development of new industries based on local raw materials, labor, capital and transportation facilities, and (3) improving community assets for economic growth.[87] Of broader scope are the activities of the Division of Area Development, in cooperation with the Federal Inter-Agency Basin Committee. The activities of the division in this area are pointed toward two needs in river basin development: (1) preparations of over-all economic base surveys of the various basins in order to sharpen up regional geographical problems, potentialities, and desirable program directions, and (2) determination of specific investment opportunities of an industrial and commercial nature made available in various basins as a result of the comprehensive and coordinated resources program. Well over a dozen professional geographers are employed in the office of the director and its four main divisions.

The State and Community Development Division (1) provides on-the-spot technical area development assistance to organized state and local development groups; (2) guides local groups to take advantage of the successful development experiences of other communities; (3) assists local groups to plan and undertake area surveys and to use fully federal programs already available; (4) assists local groups in identifying those growth industries most suited to local resources (in collaboration with Resources Analysis Division); (5) maintains close liaison with all federal departments having information and programs useful in area and community development; (6) prepares general technical development aids necessary to counseling activities on such subjects as available federal programs helpful to community development and

87 Most of the material on the geographic work of the Office of Area Development was extracted by Clarence F. Jones, directly from the following: Office of Area Development, Manual of Orders, Part I, Department of Commerce, August 10, 1956, pp. 1-15; 45th Annual Report of the Secretary of Commerce, Department of Commerce, 1957, pp. 62-64; Federal Programs of Community Assistance, Department of Commerce, January 1957, pp. 1-12; A Listing of Office of Area Development Publications, Department of Commerce, December 1957, two pages.

checklists of community action; and (7) in cooperation with state planning and development agencies helps organize and assists local small industry committees to increase non-farm job opportunities and income levels in rural areas through identification of small industry possibilities and methods of developing them.

In the fiscal year 1957 technical assistance concerned with industrial and area development problems was requested from 360 communities in 47 states, about 50 per cent coming from labor-surplus communities. Forty-three labor surplus communities were studied and fact sheets listing industrial assets for 26 communities were prepared by the end of the fiscal year 1957.

The Resources Analysis Division conducts research on the various possible uses for the resources of areas, industrial location advantages of areas, industrial growth trends, successful community experiences, and other resource and development matters useful to area development. Besides the continuing research on subjects of use to all areas, the Division does research on specific areas at the request of, and in cooperation with, the State and Community Assistance Division. Specifically the Division: (1) analyzes the industrial location advantages of labor surplus areas and identifies the types of industries potentially suited to those areas; (2) reports on industrial location trends and the location requirements of growth industries; (3) prepares and publishes area economic trend studies, showing which areas are lagging behind national growth rates and those exceeding these rates; (4) collects information on successful community programs for economic development throughout the nation as guides for other communities to follow; (5) reports on successful community efforts to use neglected resources to create more jobs; (6) acts as a clearing house for state and local groups and labor surplus areas on federal data, programs, and information through periodical bulletins, national conferences, visual displays and other means; and (7) keeps available for use of the Office, regional and business groups, specialized statistical information on regional and local areas.

The Products Expansion Division plans, develops, and administers programs of assistance to states, communities, and private area development organizations by stimulating research in and the use of the latest technology on new products and methods, especially suitable for helping to strengthen or establish local industries in areas of labor surplus, one - industry communities, and other areas needing diversification. Specifically the Division (1) assists state, local and private area development organizations in locating, organizing, screening and utilizing new technology which may have possibilities for the areas to be assisted; (2) serves as the focal point and clearing house in the federal government through which the state and local area development groups may be put in touch with many federal agencies

which can assist in the development and administration of technological programs designed to stimulate the starting of new business or expansion of existing businesses; (3) organizes and coordinates cooperative participation by the federal government in locally sponsored technological exhibits and procurement clinics for fostering area development; (4) advises and assists local area groups in the development of exhibits to bring new technology into the area; and (5) reports on methods and experiences of community and area organizations in the field of expanding local employment through product diversification and improvement measures.

The Industrial Location Division provides a clearing house of technical and advisory services on industrial location problems for local groups, manufacturers and others. This service includes advice on how to plan and conduct industrial site surveys; information on those critical factors governing industrial location; a catalog of locational data on regions, states, and metropolitan area assistance to defense manufacturers in determining the dispersion adequacy of specific sites under the National Industrial Dispersion Program; advice on industrial zoning problems and on the development of planned industrial parks. Specifically, the Division: (1) advises on the specific location problems of individual manufacturers and businesses bring together all applicable government and other data for the purpose as well as data and policies on labor surplus areas; (2) prepares technical data and publications for use to community and other groups in planning financing, and developing planned industrial parks, and upon request, renders on-the-spot technical assistance and guidance in preparing industrial park layout plans and in other area development techniques; (3) provides a one-stop service for manufacturers, for the 100 local citizen industrial dispersion committees (voluntarily formed) and others to determine whether specific sites conform to the standards of the National Industrial Dispersion Program, as determined by Office of Defense Mobilization; (4) provides technical assistance or industrial dispersion survey preparation and on designation of potential target areas; reviews and certifies local area dispersion reports; and maintains for military, civil defense, and general governmental use a central file of urban area dispersion maps and data developed by the local committees; (5) maintains liaison with the Federal Civil Defense Administration in connection with protective construction and reduction of urban vulnerability programs; with the Department of Defense with respect to data on major military installations, and key facilities; and with the Office of Defense

Mobilization on policies, standards and the programs of the Regional Defense Mobilization Committees.

During 1957, plant locational assistance and guidance was given to more than 500 private and governmental organizations. Several informational bulletins dealing with specific aspects of plant location were issued. The Office participated in "New Products, New Methods" exhibits on six new regional projects in 16 states.

Some of the publications since 1954 of the Office of Area Development are as follows: (1) Central Business Districts and Their Metropolitan Areas. A summary of geographic shifts in retail sales growth for the years 1948 through 1954 (November 1957), 16 pp.; (2) Selected Sources on Planned Industrial Parks. A bibliography of source material (1957), 2 pp.; (3) Growth Industries in Manufacturing. Summarizes growth features of all major industry categories, and identifies individual "growth" industries (July 1957), 8 pp.; (4) Growth Industries in Instruments and Related Products (July 1957), 7 pp.; (5) Growth Industries in Electrical Machinery (September 1957), 11 pp.; (6) Growth Industries in Fabricated Metal Products (September 1957), 12 pp.; (7) Community and Area Development Checklist, BSB-145, 4 pp.; (8) Developing and Selling New Products. Based on data obtained from some 100 business firms which have successfully developed and sold many new products, the Department of Commerce and the Small Business Administration (1955), 105 pp.; (9) How to Locate Industrial Prospects for Your Community (1957), 4 pp.; (10) Industrial Uses of Selected Mineral Resources. Lists some 200 commercially significant minerals with their principal industrial uses; designed to help the community determine some of the specific industrial processing possibilities of its mineral resources (1954), 60 pp.; (11) Industrial Uses of Selected Timber Species. Lists some 40 species of commercial timber, indicating their industrial utilization possibilities (1954), 29 pp.; (12) Location Factors in the Petrochemical Industry. The forces affecting the future geographic pattern of the petrochemical industry within the United States, Office of Technical Services, (1955), 105 pp.; (13) The National Industrial Dispersion Program Order I-9 dated January 11, 1956; (14) Organized Industrial Districts - A Tool for Community Development. Based on experiences and tested techniques of developers of successfully organized industrial districts throughout the country (1954), 111 pp.; (15) What Will New Industry Mean to My Town? A summary of two case studies undertaken to determine what impact the arrival of new industry will have on a small town or rural area and to find what adjustments the community must make (1955), 20 pp.

Geographic Work in the Bureau of the Census

Geographic research has long been a part (more significant in recent years) of the work of the Bureau of the Census and this research has made many contributions towards advancing that work. Most of the geographic work of the Bureau of the Census is carried on in the Geographic Division, which regularly employs a dozen or more professional geographers. The preferred qualifications for employment in the Geographic Division are training and experience in field methods, cartography, urban geography, geography of the United States and in area analysis. The Geography Division has the responsibility for the preparation of census maps and in addition functions as the Bureau's map depository. This division has the responsibilities of providing the geographic information and materials necessary for the census surveys and of preparing maps and charts illustrating the published statistical reports. It is under the first responsibility that most of the geographic research is included. Since statistics are collected, tabulated, and presented for geographic areas, large and small, it is a primary requisite to know the various areas in the United States, political and otherwise, and the details of their boundaries. Accordingly, the major geographic research is directed towards: (a) the recognition of the political units of the United States for which statistics are desired and the exact determination of their boundaries, (b) the recognition of special-purpose census areas in the United States for which statistics are desired and the establishment of their boundaries, and (c) the establishment of administrative areas to facilitate the collection and tabulation of statistics for the areas recognized under (a) and (b).

In its program of major censuses, the Bureau completed in 1957 the detailed tabulations of 1954 benchmark data on the Nation's agriculture, its retail, wholesale and service trades, and its manufacturing, mining and quarrying activities, and it also published many maps of some of these data.[88] The Bureau published early reports from the 1957 Census of Governments on the

88 The report on the Bureau of the Census was taken largely by Clarence F. Jones from (1) "Geographic Reports," Series Geography, Bureau of the Census; (2) Clarence E. Batchelet and Alford Archer, "Comments on Geography and Cartography for Census Purposes Emphasizing Map Presentation for the 1960 Census of America," IV Session of the Committee on Improvement of National Statistics, Washington, D. C., (October 1956), pp. 1-13; (3) Annual Reports of the Secretary of Commerce, Washington, D. C.; "A Report on the Status of Geography in the United States 1950-1952," Third Pan American Consultation on Geography, Doc. 8, Washington, D. C., June 18, 1952, and others.

number and kinds of state and local governments and on real estate assessments. At the same time, it began preparations for the 1958 Censuses of Business, Manufactures, and Mineral Industries, and for the 1960 Censuses of Population, Housing, Agriculture, Irrigation and Drainage.

An effective way to present some of the types of geographic work of the Bureau of the Census, especially under the direction of its professional geographers, is to give here Mr. Brunsman's statement of "Geographic Areas for the 1960 Censuses of Population and Housing."[89]

"In 1950 and in other recent censuses, the Bureau of the Census recognized nine geographic divisions and four regions. The divisions represent a grouping of contiguous States, and regions are composed of groups of divisions. A committee of the Department of Commerce has defined a new grouping of States into regions and divisions based on homogeneity of contiguous States. The proposed new grouping has been submitted to the Bureau of the Budget of the Executive Office of the President for its approval.

Regions and Geographic Divisions. The composition of the proposed regions and divisions is as follows:

1. Northeast	
(a) New England:	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut
(b) Middle Atlantic:	New York, New Jersey, Pennsylvania, Maryland, Delaware, District of Columbia
2. North Central	
(a) Great Lakes:	Wisconsin, Michigan, Illinois, Indiana, Ohio
(b) Plains:	Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas
3. South	
(a) Upper South:	Virginia, West Virginia, Kentucky, Tennessee
(b) Lower South:	North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana
4. West	
(a) Southwest:	Oklahoma, Texas, New Mexico, Arizona
(b) Rocky Mountains:	Montana, Idaho, Wyoming, Colorado Utah
(c) Far West:	Washington, Oregon, California, Nevada

89 Howard G. Brunsman, Chief of the Population Division of the Bureau of the Census, "Geographic Areas for the 1960 Censuses of Population and Housing," prepared for the use of the Committee on the 1960 Population Census of the Population Association of America, Bureau of the Census, (September 27, 1956), Washington, D. C., pp. 1-14.

State Economic Areas. A set of State Economic Areas was established for use in the 1950 Censuses of Population and Agriculture. Each Standard Metropolitan Area that had a population of 100,000 or more in 1940 was recognized as a Metropolitan State Economic Area. When such an area was located in two or more states, the portion of each State became a separate State Economic Area. In New England the Metropolitan State Economic Areas are composed of those counties with more than half their population in a Standard Metropolitan Area. Thus, the smaller Standard Metropolitan Areas of 1950 and those that were set up on the basis of the 1950 population are not classified as Metropolitan State Economic Areas. The counties located outside the Metropolitan State Economic Areas have been grouped into non-Metropolitan State Economic Areas, each area comprising one or more separate counties. Thus, a total of 501 State Economic Areas was established. In both the Census of Population and the Census of Agriculture, however, some of these State Economic Areas were consolidated. The set used for the Census of Population consisted of 443 areas. These sets of State Economic Areas have been utilized in tabulations of change in place of residence between 1949 and 1950 and in many of the tabulations of the 1950 and 1954 Censuses of Agriculture. It is assumed that State Economic Areas will be recognized in the 1960 census. The composition of these areas will be revised to conform to changes in the boundaries of the Standard Metropolitan Areas. Other changes might be made because of changes in the composition of the various counties, although an effort will be made to maintain comparability with 1950.

Economic Subregions. The 501 State Economic Areas of 1950 were consolidated into a set of 119 areas which cut across State lines but which preserve, to a great extent, the homogeneous character of the State Economic Areas. These economic subregions have been recognized in some of the migration tabulations and also in the special report on the characteristics of rural-farm housing. It is probable that a similar set of economic subregions will be established for use in the 1960 census.

Standard Metropolitan Areas. Except in New England, a Standard Metropolitan Area, as defined for the 1950 census, was a county or group of contiguous counties which contained at least one city of 50,000 inhabitants or more. In addition to the county or counties containing such a city or cities, contiguous counties were included in a Standard Metropolitan Area if they were essentially metropolitan in character and socially and economically integrated with the central city. In New England, towns and cities were the units used in defining metropolitan areas. The determination of the composition of each Standard Metropolitan Area was made by the Federal Inter-agency Committee on Standard Metropolitan Areas composed of representatives of interested federal agencies and sponsored by the Bureau of the Budget. It

is assumed that Standard Metropolitan Areas will be recognized in the 1960 Censuses of Population and Housing. Some of the users have suggested that greater comparability might be achieved if the Standard Metropolitan Areas in New England were composed of entire counties. Conversely objections have been raised to the inclusion of the sparsely-settled parts of some of the counties now included in metropolitan areas. It has also been suggested that certain areas that contain no city of 50,000 or more be established as metropolitan areas. This might be done by lowering the minimum population of the metropolitan area as a whole. It has been proposed that subareas be established within a few very large Standard Metropolitan Areas such as New York and Chicago and that separate statistics be published for these subareas.

Urbanized Areas. An urbanized area, as defined for the 1950 census, includes at least one city with 50,000 inhabitants or more in 1940 and also the surrounding closely settled incorporated places and unincorporated areas which had at least 2,000 persons per square mile. Separate statistics were published for each of these urbanized areas as a whole. Furthermore, all of the population within the urbanized areas was included as part of the urban population. It has been proposed that urbanized areas be established in 1960 for central cities of less than 50,000. Some of the census users have suggested that the concept be extended to include the fringes of all places of 2500 or more. It is unlikely that the program can be expanded to this extent but serious consideration has been given to the possibility of establishing an urbanized area for each place of 25,000 or more. There were 157 urbanized areas in 1950. If the 1950 criteria were followed in 1960, it is estimated that the number of areas would increase to 210. The expansion of the program to include all cities of 25,000 or more is likely to increase this number by an additional 175.

Unincorporated Places. In the 1950 Census of Population, the Bureau of the Census established arbitrary boundaries of 1,430 unincorporated places of over 1,000 inhabitants. It has been suggested that this program be extended in 1960 to places of 500 inhabitants or more. This proposal would increase the number of places to approximately 5,000. Some dissatisfaction has been expressed over the publication of statistics for unincorporated places with arbitrary boundaries when such boundaries were not locally recognized and over the failure to publish similar statistics for New England towns and other similar areas of corresponding size. It has been suggested that the entire town or minor civil division be established as an unincorporated place when the unincorporated built-up community dominates the area and population of the town. Under this proposal a number of towns in New England, New York, and New Jersey would be recognized as unincorporated places, and the same type of statistics would be published for these places as for other un-

incorporated places of corresponding size. In a corresponding manner, objections have been raised to the fact that the Census Bureau failed to recognize separate unincorporated places within the urban fringe. It has been proposed that such places be recognized in 1960 and that the same data be published for them as for incorporated places of corresponding size.

Census Tracts. Population and housing statistics for 1950 were published for about 12,500 Census Tracts in 67 areas. The tract area always includes the central city and sometimes includes other areas in the Standard Metropolitan Area. The Bureau of the Census is encouraging the establishment of Census Tracts in all cities of 50,000 or more and in all areas within Standard Metropolitan Areas of 100,000 or more. It is likely that more than 25,000 Census Tracts will be recognized in the 1960 Census.

Blocks. Limited housing statistics were published by city blocks for cities of 50,000 or more in 1950. Corresponding coverage of places of this size would cover between 650,000 and 700,000 blocks in 1960. It has been suggested that similar statistics be published for blocks in the outlying parts of the urbanized areas of cities of 50,000 or more. This change would increase the recognized number of blocks to 1,100,000.

Census County Division. The minor civil divisions recognized in the 1940 Census for the State of Washington were the election precincts, a few townships, and some of the cities and towns. Those election precincts were not suitable for statistical purposes because their boundaries changed so frequently as to prevent comparison of data from one period to another. Accordingly, these areas were replaced in the 1950 census by "census county divisions" which were newly-established special areas which will remain as relatively permanent statistical areas. A total of 642 census county divisions were established in the State. Each incorporated place with a population of 2500 or more was made a separate census county division. The census tracts adjacent to Seattle and Tacoma were recognized as census county divisions.

It is planned to extend this program of census county divisions into other States where minor civil divisions are unstable or where the minor civil division boundaries are largely unknown by the general population. These census county divisions have already been established in the States of Oregon, Idaho, Colorado, Georgia, and Tennessee, and work is under way on the establishment of them in South Carolina, Arizona, New Mexico, Utah, Wyoming, Louisiana, Alabama, and Kentucky. It is hoped that this program can be extended to an additional group of five or six States prior to the 1960 Census.

It is believed that this program will increase the accuracy of the census statistics since physical boundaries will be used in defining the new areas and that the resulting statistics will prove

more valuable since the areas are more homogeneous and will be more permanent.

Minor Civil Divisions. The publications of the 1940 Censuses of Population and Housing included limited statistics on characteristics for minor civil divisions which are the primary political divisions into which the counties are divided. The 1950 publication was limited to total population of each of the minor civil divisions. Many groups have recommended that the publication of characteristics for minor civil divisions be reinstated in 1960. This recommendation has been made especially for New England towns, New Jersey townships, and for census county divisions.

The amount of geographic work involved in definition, delimitation, and the assembly and evaluation of political boundary information on all the above twenty-two types of special-census areas and subregions for the United States is enormous. The total number of such areas and subregions runs into the millions. This work involves not only office map and aerial photointerpretation, statistical computations, and much correspondence with local officials, both preliminary and review, but it also in many cases involves actual geographic field work. Of course, not all of this work is done by geographers, although they generally have a significant part in each phase. Agriculturists, industrialists and other businessmen, local officials, planners, political scientists, sociologists, statisticians and others all share in the work in one way or another.

Although the preparation of base maps for census taking and of maps based on census data is looked upon by some as falling largely within the category of cartographic operations, both types of maps involve geographic research and techniques at many stages and in many ways. The making of accurate dot, isopleth, and other types of distribution maps of populations, settlement features, agriculture, and other elements requires geographic knowledge of the physical and cultural characteristics within the geographic area and also of the elements being mapped. It is not an exaggeration to state that the greater the detail of knowledge of the characteristics of area and phenomena being mapped the greater the accuracy and effectiveness of the maps.

During the past decade geographers, cartographers, and statisticians in the Bureau of the Census have made outstanding contributions to the geography of Latin America in the project called the Census Atlas Project, which is a part of the program of the United States Bureau of the Census, under an agreement with the Foreign Operations Administration (now the International Cooperations Administration, United States Department of State). Under this project geographers and others from the Bureau of the Census conducted training programs in census geography and

geographic presentation of statistical data in several countries.[90] Under this project technicians have been trained to specialize in this work in Costa Rica, Cuba, El Salvador, Haiti, Honduras, and Mexico. Also geographic consultants visited most of the Latin American countries to provide technical assistance in census geography, cartography and atlas preparation. The many problems involved in the definition of census areas, preparation of base maps for census taking and the making of maps of distribution of census data for the Latin American countries were for the most part similar to those outlined above for the United States, but in many cases much more difficult.[91]

The desirability of Census Atlas publication was recognized by the Pan American Institute of Geography and History in a resolution passed at the Fifth General Assembly in Santiago, Chile, October 16 to 27, 1950, stating "That among the publications relating to the results of the Census of the Americas, there be included an Atlas containing the demographic and economic data on a cartographic base as soon as possible" (Resolution No. 74). The project was given impetus by the enormous wealth of data obtained by the 1950 Census of the Americas, in which 19 of the 21 republics participated. Out of this cooperative program have come census atlas maps of Central America[92] and the Greater Antilles,[93] the Atlas Estadistico de Costa Rica,[94] the series of

90 The work in Latin America is a significant part, but a relatively small part, of the work in foreign countries of the Bureau of the Census. In 1957, 326 foreign census and statistical personnel representing 54 countries visited the Bureau for brief periods and observed operations and methods. Thirty-nine foreign technicians, representing 16 countries spent three or more months in intensive instruction in United States census methods. Under the technical assistance program 14 Bureau of the Census experts were assigned as consultants to foreign governments. 45th Annual Report of the Secretary of Commerce, United States Department of Commerce, Washington 1957, pp. 76-82.

91 Clarence E. Batchelet and Alford Archer, op. cit., pp. 2-7.

92 F. Webster McBryde, "Census Atlas Maps of Latin America, Part I Central America," United States Bureau of the Census in cooperation with the Foreign Operations Administration, Washington, D. C., 1955, pp. 1-4 and nine maps.

93 F. Webster McBryde, "Census Atlas Maps of Latin America, Part II Greater Antilles," ibid, 1956, pp. 1-4 and seven maps.

94 Emilio Wille Trejos and Alford Archer (Geographer Consultant) Atlas Estadistico de Costa Rica, Direction General de Estadistica y Censos, San Jose, Costa Rica, 1953, pp. 1-114.

maps in the Primer Censo Agropecuario, 1952, Republica de Honduras,[95] and others.

Recently the Geography Division has published one atlas map which follows the specifications recommended by the National Atlas Committee of the United States. In the many more sheets to be released soon the ones to appear in the near future will be mainly presentations of data from the 1954 Census of Agriculture.[96]

The Bureau of the Census has several continuing functions of a distinctly geographic nature and others that are not. The measurements are obtained for many years, and now measurement of many areas will have to be carried out in order that 1960 density data can be presented in either tabular or graphic form. The selection and definition of sample areas for surveys is also a continuing function, although of relatively recent development. Investigation and use of these sample methods were prompted because studies had shown that, "Wherever the problem of obtaining information concerning a large aggregate of people, farms, firms, records, or other units occurs, a sample survey or sample study is likely to provide results of a desired precision at relatively low cost."[97] The Bureau of the Census conducts monthly surveys of the United States on a sample basis, and the areas sampled are periodically revised. Finally, the Bureau furnishes geographic information of all sorts on a continuing basis to the President, members of the Cabinet, members of Congress and other governmental agencies - federal, state and local - as well as to the general public.

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95 C. Zuñiga Figuero and others, Primer Censo Agropecuario, 1952, Republica de Honduras, published by Lud Dreikorn, San Salvador, El Salvador, December 1954, pp. 1-592; maps on pp. 2-28.

96 Actually, the Bureau of the Census, in collaboration with other organizations, sponsors an enormous amount of geographical research. To cite one example - Ronald Mitchell "American Agriculture: Its Structure and Place in the Economy," Census Monograph Series No. 1 (1955), 187 pp. For the Social Science Research Council in cooperation with the U. S. Department of Agriculture, Agricultural Research Service, and the U. S. Department of Commerce, Bureau of the Census.

97 Quoted in Clarence E. Batschelet and Alford Archer, op. cit., p. 6, from Morris H. Hansen, William N. Hurwitz and William G. Madow, "Sample Survey Methods and Theory," John Wiley and Sons, New York, 1953, p. 1. Although sampling methods may give quite accurate results for such things

Coast and Goedetic Survey[98]

As a scientific and mapping agency, the United States Coast and Geodetic Survey contributes much to geographic knowledge. Its hydrographic charting provides information about the nature of our continental shelf and changing shoreline; its geodetic surveys produce data pertinent to mathematical geography; its tidal studies integrate a number of factors of geographic importance; and its geophysical explorations reveal pertinent facts about earth magnetism, seismology, and geological structure.

Because its realm of activity is largely the coast, the Coast and Geodetic Survey has been obligated to assume the role of coastal geographer. Requests for information about the physical geography of the coast are received constantly from official sources and the public. A small staff of geographers is maintained by the Coast and Geodetic Survey to perform the necessary geographic research and answer the requests, together with research on geographic names and basic map source material. Testimony in the Supreme Court on geographical matters in the Tidelands Oil Case was provided by this staff, as well as a continuous provision of published informational matter of a geographic nature, the latter of which included an official history of the Coast and Geodetic Survey, constituting a brief record of the growth of knowledge about the geography of the United States and its possessions.

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as mentioned in the quote, the development of sampling methods to portray geographical distributions of physical and cultural features of a large complex area and the relations between the two sets of features has far to go for satisfactory results from the point of view of the geographer. See discussion and references referred to in Preston E. James and Clarence F. Jones (Editors), American Geography: . . . op. cit., pp. 268-269, 276, and 393-394.

98 This first part of this section was written by A. Joseph Wraight, but the paragraphs on work during 1957, and on the International Geophysical Year were taken from the 45th Annual Report . . . op. cit., pp. 20-25; from A. Joseph Wraight (Geographer) and Capt. Elliot B. Roberts, "The Coast and Geodetic Survey, 1807-1957," United States Department of Commerce, Washington, 1957, pp. 1-89; and from Rear Admiral Robert F. A. Studds, "The United States Coast and Geodetic Survey, Products and Functions," (Revised), United States Department of Commerce, Washington, (1957), pp. 1-41.

In its work of a geographic nature the record of the Coast and Geodetic Survey in 1957 is an impressive one. In area triangulation and area leveling, a total of 2,701 new geographic positions in the United States was determined and elevations established for 11,654 benchmarks. As the world's leading agency in earthquake investigation the Bureau, through its own (seven of its own stations and thirteen cooperative Bureau and University stations) and several hundred independent stations throughout the world, supplied information on 1,277 earthquakes. To meet the needs of the navigator the Bureau was called upon to produce 54 million copies of nautical and aeronautical charts,[99] one-fourth more than in 1956. Under the airport mapping program photographs were taken of 60 airports and field surveys of 48 airports completed. Of special interest, perhaps, is the resurvey of Georges Bank in support of the New England fishing industry. The Bureau continued its international technical cooperation serving regular trainees and visitors from many foreign countries.

A highlight in the year's work of the Coast and Geodetic Survey, as it was in several other agencies, was its operations in connection with the International Geophysical Year. Observational work in geomagnetism, seismology, gravity, latitude and longitude, oceanography, and the maintenance of the World Data Archive Chart was assigned to the Survey. Magnetic recording stations were established in Alaska, United States, Pacific Islands, and in Antarctica and new employees trained to operate these stations.

Weather Bureau[100]

Geographers with specialties in meteorology or climatology can fill positions in the Weather Bureau. For such employees there is a minimum requirement of twenty credit hours of work in meteorology or climatology, three hours of which should be in dynamic meteorology. The Weather Bureau employs a total of more than 8,550 persons, but at least 86 per cent of these are observers at 316 field stations and overseas stations. Most of the research and operation of a geographic nature is done by about 10 per cent of the employees who serve in seven offices or divisions; Forecasts and Synoptic Reports Division, Office of Meteorological Research, Regional Offices, Hydrologic Services Division, Office of Climatology, Polar Operations, and Office of Physical Research. Nearly all of this personnel consists of scientists, other than professional geographers.

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99 The Coast and Geodetic Survey publishes (1) World Aeronautical Charts, scale 1:1,000,000, covering the United States and Alaska, and (2) the USAF Jet Navigation Charts, scale 1:2,000,000, covering the United States.

100 This section was extracted by Clarence F. Jones, from the 45th Annual Report . . . op. cit., pp. 45-52.

In recent years great progress has been made in the accuracy of tornado forecasts--a development which is credited with saving hundreds of lives. The new Weather Bureau film, "Tornado," seen by more than 41 million people, shows precautionary measures that can be taken by communities and individuals to reduce losses of life and property. Detailed studies were made of many severe local storms, including tornadoes, squall lines, and intense thunderstorm activity, with emphasis on the development of instability in the upper air leading to severe storm outbreaks, as well as on the detailed "meso-analysis" of surface and upper air conditions associated with storm situations. Also great progress has been made in research on the formation, intensification, movement and dissipation of hurricanes. Extensive studies, which are expected to have great value in the planning of flood control and other public works, were completed and published in 1957 on maximum precipitation over selected states and drainage basins. As a part of the Weather Bureau's modernization program in the field of climatology, 28 climatologists have been appointed to devote full time to special climatological problems of their respective 28 states. With support from the Navy, the Office of Climatology has completed the Atlantic, Pacific, and Indian Ocean sections of a new Marine Climatic Atlas of the World, and three more sections are in preparation.

The Weather Bureau was assigned the responsibility of carrying out the United States meteorological program in the International Geophysical Year. As a part of this activity six weather stations were established in the Antarctic in conjunction with the Navy; also, the Weather Bureau, working closely with the Department of State, set up five cooperative upper air stations in Chile, Peru and Ecuador; and in the Arctic, Weather Bureau specialists worked at stations set up on two drifting ice floes. Special high-altitude radiosonic balloons were made and used at selected stations in the United States, Canada, Alaska, the Arctic and South America to obtain data at significantly greater heights during the International Geophysical Year.

Department of Defense[101]

As pointed out above, the Department of Defense leads all other government departments in the employment of geographers

101 Except for specific sections for which authors are indicated, the report on the Department of Defense was written by Clarence F. Jones. His information is based upon his experience (1) during World War II in the Board of Economic Warfare and the Office of Strategic Services, and as director of the Latin America Area Analysis Project of the Office of the

see (Table XIII - note especially the information in the footnotes).[102] The use of persons with geographic training in the Department of Defense appears to be increasing at a moderate rate. However, the positions of many of these persons are classified as Intelligence Research Specialists and Cartographers, rather than as Geographers. That the military agencies need up-to-date and accurate information requires no explanation, especially when one realizes that their forces must be equipped to operate effectively at any time in a great variety of world areas, that, in toto, embraces the gamut of climatic, terrain, and cultural variations. To obtain an understanding of the characteristics and military implications of these diverse geographic complexes in order to avert or to minimize the environmental factor in military operations, the Department of Defense has several offices and divisions whose chief responsibility is to search to obtain accurate geographic information and research on adaptability of materiel to these geographic complexes.[103] The nature and scope of much of

101 (Cont.) Coordinator of Inter-American Affairs and the National Planning Association; (2) later as chief for several years of one of the panels of the Research and Development Board; and (3) at various times as Consultant to other agencies. This information is supplemented with that in the cited references, as well as others. The author believes his statements on the geographical work of the Department of Defense are of such a nature that security regulations are not violated.

102 For years some overseas Armed Forces Units have employed geographers and others to do detailed research on foreign areas. A good example of this kind of geographic research is A Report on Japanese Natural Resources, prepared by the Natural Resources Section, General Headquarters, Supreme Commander for the Allied Forces, Tokyo, Japan, 1949, pp. 1-559, and map supplement.

103 This type of work requires a large measure of the kinds of training geographers receive. Much of this work involves topical and area analysis; a great deal of it also embraces the maintenance and evaluation of maps, charts, and repleted data; it also includes cartographic, photogrammetric and photointerpreation techniques, especially in the design, drafting and production of all kinds of maps for military use.

It is reported that there is a distinct need for departments of geography, offering training in cartography, physical geography, and oceanography, to review Civil Service Requirements and to encourage geography students to take supplemental courses in two or more of the following: mathematics, engineering, geology, meteorology, physics, and biology.

this research has been described in general terms in published reports.[104] However, a large proportion of all topical intelligence reports and also the topical and area analysis reports are classified, and thus are readily available only to government employees directly concerned with such matters. The interests of national security preclude a detailed discussion of geographic and other research to meet intelligence and developmental requirements. However, these things may be discussed in general terms without violating security regulations.

At near the top level in the Department of Defense there is in at least four of the Offices of the Assistant Secretaries of Defense a specific section, or agency, which specializes in research of a geographic nature on international security affairs and the development of supplies and materiel. In the Research and Development Board, the top-level evaluation and review agency, military requirements for and research projects of a geographic character are coordinated and appraised by a Committee on Geophysics and Geography. The members of the Committee are from the sections, or agencies, of military research and development of the three departments: Army, Air Force and Navy. As the Board is not an operating agency, the duties of its members are primarily administrative. In the field of geography the Board seeks technical advice from panels, comprised of selected civilian scientists and military specialists. The Board's geographic panels deal with the characteristics of arctic, desert and tropical areas, the problems of operations in them, and upon methods of improving geographic analysis for military purposes. The Munitions Board, another Department of Defense agency, coordinates the procurement of military supplies of the three operating departments. The Board utilizes much geographic information in connection with the evaluation of geographic conditions -- economic

104 Paul A. Siple, "The Application of Geographical Research to U. S. Army Needs," Bulletin of the American Society for Professional Geographers, Vol. 7 (April 1948), pp. 1-3; Charles H. Mason, "The Role of the Geographer in Military Training," Bulletin . . . ibid., pp. 4-6; Frank C. Whitmore, Jr., "Military Geology," Bulletin . . . ibid., pp. 7-16; T. C. Ridge, "Naval Interests in Geographical Research," Bulletin . . . ibid., pp. 17-20; Robert J. Voskuil, "Cartographers in Government," The Professional Geographer, Vol. II (June 1950), pp. 29-32; Arthur H. Robinson, "University Training for Government Cartographers," The Professional Geographer, Vol. III (September 1951), pp. 4-6.

and political -- affecting the availability of basic raw materials in all parts of the world, including the problems of procuring them and transporting them. These things involve international mobilization planning, resource development in foreign areas, international trade, foreign aid allocations, and economic warfare.

In addition to the above in each of the three operating departments -- Army, Air Force, and Navy -- several agencies carry on geographic research to meet part of their intelligence and materiel developmental requirements.

Department of the Army

The Army has at least three agencies that specialize in geographic and other intelligence -- in the collecting, sifting, collation and evaluation of geographic data, not only on the physical elements, economic conditions and on the technological level in many areas, but also on the political, social, religious and other characteristics of peoples and governments (ACSI, OCAMG, and AMS). In view of the continued and rather widespread international, political and economic tensions there is constant need for much background data and geographic analyses of them. In general, such work is largely based upon library research, personal knowledge and experience of the analysts, and upon information gleaned from persons returning from travel, business or a tour of duty of government officials in foreign areas. In some instances analysts are sent abroad to obtain firsthand data on the scene. It is in these kinds of work that the personnel, classified as geographers, in these agencies are primarily engaged.[105] The background training of these geographers varies greatly: some are specialists in the physical aspects of the discipline; others in economic, political, settlement, and urban geography: still others in cartography, for the end product of a great deal of this research is special maps and graphs, showing the distributional aspects of a single phenomenon or the complex association in an area of several related phenomena.

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105 Some geographers in the military service are employed in this and similar work. Others entering military service may be so used, providing they first obtain an appropriate MOS. Depending upon background and specialty, they may qualify for one of several MOS's. The following MOS's are considered suitable: (1) for officers, Geographer 8311, Photointerpreter 8503, Weather Engineering and Survey Officer 8204, Photomapping 7960, Research and Development Coordinator 2167, and (2) for enlisted men, Terrain Intelligence Analyst 517.2, Soils Analyst 517.1, Cartographic Draftsman 813, Physical Sciences Assistant 016, Social Sciences Assistant 018, and Photointerpreter 969.

One of the specialized agencies of the Department of the Army, which does an enormous amount of geographic intelligence work is the Army Map Service of the Corps of Engineers. Among many other scientists and technicians, the Army Map Service employs at least 140 persons with a college degree in geography. These geographers are employed at various grade levels, ranging from GS-5 through GS-14. They occupy three types of positions: (1) military intelligence research specialist, grades GS-5 to GS-13, with special interest in physical, economic, political, urban, or other aspects of geography: (2) cartographer, grades GS-5 to GS-13; (3) cartographic aid, grades GS-3 to GS-11. The geographers, classified as military intelligence research analysts are engaged in several sections, producing terrain, topical and area analysis reports on many parts of the world. A small group of geographers and others in G2 are associated with these geographers in a consultation and review capacity. The cartographers and others in the Army Map Service are involved primarily in the evaluation of maps, charts, photographs and related data from many parts of the world, and also in the compilation of information for maps and designing and drafting them for the map printing plant.

In the Department of the Army at least four offices or agencies utilize geographic talent in research designed to meet materiél developmental needs. With the almost constant advances being made in so many aspects of technology the needs for such research increase year by year. "By geographic research for development is meant investigations of a systematic nature to procure a more precise knowledge of the character of elements of an environment that have a bearing upon military operations. Carried to its logical conclusion, the scope of this type of work includes the investigations going forward on all phases of geophysics and the earth sciences. The intent here, however, is to mention only those phases of such work most closely identified with physical geography, geomorphology, and climatology and which employ trained geographers who have an interest and competence in these or very closely related fields of scientific endeavor.

"One of the principal offices engaged in this sort of investigation is the Environmental Protection Branch of the Office of the Quartermaster General. This office supports a program of investigations delving into the elements of climate, surface conditions, vegetation, and animal pests as they relate to the design, issue, and storage of items of clothing and personal equipment. As an example, this office has prepared a series of clothing almanacs designed to tell field forces what kinds of military clothing and other personal equipment should be available for issue in any month in the various parts of the world. To obtain raw data for these almanacs and other research reports, it has, in some instances, been necessary to procure field measurements

of environmental factors in various regions. These have been obtained either by single scientists or by scientific teams composed of a geographer, climatologist, physiologist, or biologist and such other scientists as indicated by the particular problem. Such intensive studies, carried out in arctic, desert, and mountain environments, are directed toward the improvement of design of clothing and equipment for maximum comfort, protection and efficiency.

"It is understandable that much of this work is concentrated on extreme environmental conditions, represented by very hot or very cold, very wet or very dry climates, very deep snow or very rugged and high terrain, which, if encountered for any extended period of time, either singly or in combination, can seriously impair human comfort and performance.[106] Once the specific qualities of the soldiers' environment have been isolated and carefully measured, there still remains the enormous task of determining their relative importance in the over-all picture as reflected in their areal distribution and probability of occurrence in other parts of the world. This is, in some instances, a problem in statistical analysis to which climatologists are devoting their attention."[107]

In a relatively similar manner the Corps of Engineers and the Ordnance Department carry on research on "other elements of the environment, for instance, soils and their bearing strength in relation to (a) trafficability, and (b) design of vehicle suspension gear. These examples point to the desirability of ultimately having an analysis of the physical environment of world regions in terms of the critical elements or combinations of elements that impede or preclude satisfactory equipment performance. If this cannot be accomplished for all regions, the process may be developed at least to the point of enabling prediction, with more accuracy than is now possible, of the probable effectiveness of all principal types of military gears in terms of environmental conditions. It will be apparent that competent geographers with special interests in soil science, plant ecology, and climatology of various world regions can be immensely useful in a program of this nature."[108]

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106 The Snow, Ice and Permafrost Research Establishment and other groups like it carry on many research projects involving studies like those mentioned here; this footnote, not a part of the quote, was added by Clarence F. Jones.

107 Quoted from A Report on the Status of Geography in the United States 1950-1952, The Third Pan American Consultation on Geography, Washington, D. C., Doc 8 (June 18, 1952), pp. 23-24.

108 Ibid., p. 24.

Department of the Air Force

The Department of the Air Force has several agencies that carry on geographic and other research to meet its materiel developmental requirements. These are in four of the major divisions of the Air Force. This research is quite similar to that carried on by the Department of the Army, described above, for the Air Force must experiment with the performance of all kinds of aeronautical equipment and air personnel, not only in various environmental complexes on the ground, but also in several layers of the atmosphere. The tremendous acceleration of scientific development makes constant research necessary. However, in contrast to that of the Army, the materiel developmental research of the Air Force involves more specific attention to atmospheric conditions. Not all the geographic research conducted by these agencies is for developmental requirements; some of it turns out to be distinctly intelligence in nature. The reverse is also true of the Air Force agencies, that are primarily engaged in intelligence research.

The Department of the Air Force has at least four agencies that carry on geographic research for its intelligence needs (SAI in the Office of the Secretary, Air Weather Service, Air University - Air War College at Maxwell Air Force Base in Alabama, and the Aeronautical Chart and Information Center). Research in the Air Weather Service is similar to many of the research projects of the Weather Bureau in the Department of Commerce (see pp. 77-78). Neither the Air War College nor the Air Command and Staff School of Air University deal with geography in the manner customary in civilian colleges and universities. However, geography plays a significant part in the lecture program and in required research subject matter, dealing with many military problem areas. The Air War College has a geographic-cartographic section to aid in specific research requirements of this school and the Air Command and Staff School. Early in World War II, the Aeronautical Chart and Information Center began to develop aeronautical charts on a world-wide basis. Now, the Aeronautical Chart and Information Center at St. Louis is one of the largest map making and distributing centers not only in the United States, but also in the world.[109]

109 Civilian employment in ACIC increased from only 350 in 1946 to about 3500 in 1957. In the past two years employment in the Washington offices of ACIC has been reduced greatly, but even greater expansion is taking place in ACIC at St. Louis. The production and distribution plant in St. Louis is the central and principal activity of ACIC. Map production in ACIC is enormous. "Between June and December 1955 ACIC printed 175 million aeronautical charts" -- Robert E. Cramer, "Cartography at the Aeronautical Chart and Information Center, St. Louis," The Professional Geographer, Vol. VIII (November 1956), pp. 7-9.

Since World War II the amazing advances in aeronautical equipment and the increased flexibility of its use have demonstrated that aeronautical charts must be designed to the air environment.[110] In fact, in some instances they must be fitted to a specific air operation. Charts made for high-altitude flight require a different emphasis in portrayal of detail as contrasted with those aimed for high-speed low-level flight, and a general purpose chart usable for training or transport operations at medium altitudes would not be suitable for either high-level or low-level operations. Recently new ultrasonic aircraft, special weapons, and electrical equipment have altered some of the basic concepts of air navigation. Almost every Air Force operation from planning stage to completion of mission is dependent to some degree on charts produced by ACIC.

The Aeronautical Chart and Information Center is charged with the responsibility for providing the Air Force with aeronautical charts, aeronautical information publications, maps, terrain models, evaluated intelligence on air facilities, and related cartographic services. The Production and Distribution Plant is the central production activity of ACIC. It is headed by a civilian chief who maintains staff or support offices for production engineering, production control, specification and techniques, and chart quantity analysis. There are six principal production elements of the P & D Plant: (1) The Chart Research Division selects and maintains an evaluated collection of charting source material as well as geodetic, geophysical, and mathematical data required for cartographic production programs, (2) the Photogrammetry Division produces through compilation and negative preparation materials for printing medium and large scale aeronautical charts, mosaics, radar intensity predictions, geodetic data sheets and Target Area Analysis (Radar) for U. S. Air Force, (3) the Aeronautical Information Division evaluates, prepares and disseminates Operational Aeronautical Information and Air Intelligence pertaining to world-wide air facilities to meet requirements for the Department of Defense and other governmental agencies, as required, (4) the Cartography Division produces through compilation, negative preparation, and photographic processes, materials for printing medium and small scale aeronautical charts and related items for U. S. Air Force, (5) the Printing Division reproduces by photo-mechanical and mechanical printing process lithographed aeronautical charts and related publications, and

[110] Most of the information on the geographic work of ACIC is based on a recent 13-page mimeographed pamphlet distributed by the Office of Information Services of ACIC.

(6) the Distribution Division is responsible for the storage, packaging and shipping of charts and publications to points throughout the world.

Geographers are employed in several divisions of ACIC; more than 50 geographers are in the Editing Branch of the Cartography Division. The production each year of a hundred million charts requires large numbers of professionally trained personnel. About three years ago ACIC found that the supply of academically-trained or experienced cartographers was virtually depleted. "Approximately two years ago, therefore, the ACIC instituted a program of employing persons holding degrees in geography and related subjects. This group was employed in the Editing Branch of the Cartography Division where they received the necessary specialized training in cartography and its particular application to the ACIC. The program proved to be very successful, for ACIC found that the geographers brought a fresh approach to charting and readily acquired cartographic skills. As a result, ACIC became increasingly aware of the importance of geography's contribution to the accomplishment of their mission. They appraised and evaluated existing charts and did much to enhance their value and improve the portrayal of geographic features. They contributed to research projects pertinent to unusual problems of detail portrayal, such as: the population patterns of Southeast Asia, treatment of relief tints in areas of North Africa, portrayal of the seasonally-flooded rivers of Northern Russia, Polar Ice portrayal, etc. As a result of these and other contributions, the ACIC encourages employee enrollment in geography courses at local universities, and attendance at professional geography meetings. In many new series of charts, the selection of detail and optimum portrayal of chart features requires an individual of special talent and training. A critical review of the profession capable of doing this type of cartographic work indicates that geography is the most desirable since the academic background includes the basic sciences, which impart a knowledge of scientific problem-solving methods. The geographic discipline also provides an intimate knowledge of regions, cartographic principles, techniques, map interpretation and evaluation, and a knowledge of physical and cultural patterns and their interrelationships."[111]

ACIC produces and maintains several series of standard and special aeronautical charts for all types of operations. The more important series are: (1) World Aeronautical Charts, scale 1:1,000,000, providing world coverage of land areas, and depicting

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111 Quotes from a letter to Clarence F. Jones from F. A. Clemens, Chief of the Cartography Division, ACIC.

as many topographic, hydrographic, and cultural features as is practicable to show at this scale;[112] (2) USAF Pilotage Charts, scale 1:500,000, covering selected areas of the World; (3) USAF Aeronautical Approach Charts, scale 1:250,000, covering selected areas where current air operations require rather detailed ground information; these charts are also used for intelligence and planning purposes; (4) USAF Jet Navigation Charts, scale 1:200,000, providing world coverage of land areas;[113] (5) USAF Aeronautical Planning Charts, scale 1:5,000,000, providing world coverage of land and water; and (6) other series for other specific purposes; Strategic Planning Charts, Weather Plotting and Recording Charts, Geography Charts, etc., all at various scales. ACIC also produces other "aids to navigation", such as (1) USAF-USN Pilot's Handbooks, (2) In-Flight Data Booklets for areas of major Air Force Operations, (3) Jet Flight Information Manuals, etc.

Department of the Navy

In the Department of the Navy at least eight offices or agencies carry on research of a geographic nature to meet materiel development or intelligence requirements. Materiél development research in these agencies in broad outline is similar to that in the Army or the Air Force. A few geographers are engaged in (1) the Navy Hydrographic Office in oceanographic surveys, oceanic regional studies, and geographic name and gazetteer work, (2) the Naval Aerology Branch in weather and climate studies as they have a bearing on naval operations, (3) the Navy Photographic Interpretation Center in photo and map evaluation and interpretation and cartography, (4) the Office of Naval Intelligence in research and administration, and (5) the Office of Naval Research in studies embracing most of the aspects of geography. The Geography Branch of the Earth Sciences Division of the Office of Naval Research is considered to be the principal agency in the Department of the Navy supporting geographic research.

"In recognition of the important bearing of geography on naval problems, the Office of Naval Research makes funds, equipment and transportation available for the support of geographic research as a part of its broad scientific program. The Geography Branch, ONR, is providing support for researchers in the many fields of geography. Support is provided through contracts between the

112 The United States Coast and Geodetic Survey produces WACs covering the United States and Alaska.

113 The United States and Geodetic Survey publishes the four JNs covering the United States.

U. S. Navy and the university or institution employing the principal investigator. Since the start of the program in 1949, several hundred geographers and scientists in allied fields have been thus aided in the conduct of research on their own topics or areas of specialization. The Office of Naval Research follows a policy of avoiding detailed direction of basic research, and recognizes that basic research should not be impeded by security regulations. Investigators may communicate their ideas to their colleagues and are encouraged to publish their results in scientific journals.

"The scope of the research program sponsored by the Geography Branch, ONR, is essentially unlimited within the broad field of geography. Proposals dealing with research on any aspects or topics in geography are welcomed. For example, regional and systematic studies as well as studies on coastal geography, photo-interpretation, field techniques, and methods of presentation are all appropriate for submittal to the Geography Branch for support. Encouragement is given for the submittal of interdisciplinary or group projects and those which afford effective research training of young geographers. Also desirable are proposals which will enable the investigators to devote full time to the research for considerable periods.

"The National Research Council, at the request of ONR, has appointed an Advisory Committee of outstanding geographers to advise the Geography Branch on its scientific research program. One responsibility of the Advisory Committee is to review research proposals submitted to it by the Geography Branch and make recommendations concerning their support.

"The Advisory Committee evaluates the scientific merit of proposed research, estimates the significance of the research to the advancement of geographic knowledge, and examines the training, experience and demonstrated ability of each investigator.

"It should be emphasized that the Committee acts in an advisory capacity only and that many considerations in addition to scientific merit will dictate which projects recommended by the Committee will be supported by the Geography Branch.

"The Advisory Committee meets two or three times a year, usually in late October, mid-February and April. Research proposals should be received by the Office of Naval Research at least one month in advance of the meetings. Applications for the support of research to begin in June or July should be submitted before January 1.

"Research proposals should contain the following information to secure consideration:

1. A detailed technical description and schedule of the proposed research, clearly indicating the immediate and long-range objectives.
2. A resume of the methods and techniques to be employed.

3. A statement of the ways in which the proposed research will contribute to the advancement of geographic knowledge.
4. A statement of previous work by the applicant and by others which relates directly to the proposal, including a bibliography of pertinent publications.
5. Name, background, and proposed function of each investigator and professional associate to be employed on the project.
6. Description of general and special facilities available for performing the contemplated work.
7. Estimated duration of project and yearly budget breakdown, itemizing the following:
   (a) Individual salaries, including an enumeration of research personnel who will devote full or part time to the project as professional investigators, graduate or undergraduate students, and technicians, whether or not reimbursed through the Office of Naval Research.
   (b) Estimate of capital equipment and its cost.
   (c) Estimate of expendable equipment and its cost.
   (d) Other expenses (travel, clerical, etc.).
   (e) Overhead.
   (f) Extent of participation by the institution in this research project.
8. Other research projects, governmental and otherwise, currently being undertaken by the principal investigator, indicating title, sponsorship, duration and amount of support.
9. Information as to any other agencies to whom the proposal is being submitted for possible financial support or assistance.
10. Twenty (20) copies of proposals to the Geography Branch are required. The original and one copy must be signed by the Principal Investigator, the Head of the Department and approved by an authorized business official of the institution.

"Proposals may be sent direct to the Geography Branch, Office of Naval Research, Washington 25, D. C., with one copy to the ONR, Branch Office, or ONR, Resident Representative."[114]

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[114] Quoted, as revised by Walter H. Bailey, from "Announcement of the Office of Naval Research Contracts for Research in Geography," Annals of the Association of American Geographers, Vol. XLIII (March 1953), pp. 1-3.

Program of Research of the Geography Branch, Earth Science Division of the Office of Naval Research.[115]

The program of the Geography Branch is divided into four "projects": (1) Arctic Research, (2) Photo Interpretation, (3) Coastal Geography, and (4) Systematic and Regional Geography.

Arctic Research. Under this project support is provided for research on the environment of arctic regions, especially the North American arctic. To facilitate field research in northern Alaska the Geography Branch maintains the Arctic Research Laboratory at Point Barrow which serves as a base and logistics center for field investigations and has laboratory and workshop facilities.

During 1957 e. g., 25 research projects, with a total of 54 personnel, were in progress at the Arctic Research Laboratory and other Arctic field stations. These represent 19 programs of research of government agencies and universities. In ten years of operations 21 government agencies have utilized the ARL to conduct special tests or research projects, 37 universities or private research institutions have participated in the basic research program, and a total of 248 scientists and technicians have conducted or assisted in research tasks. In addition to supplying guidance, coordination, and logistic support necessary to this volume of effective research, the ARL provides a continuously increasing cadre of scientists well acquainted with arctic environments. A very small fraction of the 248 who have participated in research at ARL are geographers. Basic knowledge of various elements of environment is being developed by scientists in other fields, and it is anticipated that geographers may play an increasing role in synthesizing information on the arctic.

Studies on regional climates, stressing net energy exchange and thermal, moisture and wind gradients over land and sea, provide an understanding of the major climatic controls over the biological and physical complexes near the ground. Qualitative and quantitative analysis of the origin, development and functional interrelationships of landforms, soils, microclimates and biological populations as influenced by regional climates provide essential criteria for arctic operations. Much information continues to accrue on thermal characteristics of surfaces, thermal

115 This section was written by Walter H. Bailey in the Geography Branch. Concerning this section Mr. Bailey says, "This section is quite general and selective since it refers to work that has been presented in an estimated five hundred reports."

properties of subsurface materials, and thermal gradients in the air, near the ground, and to depths of several hundred feet in the ground. These data establish many details of the historical and current relationship of environmental complexes to formation and degradation of permafrost. Behavior of permafrost is of overwhelming importance to essentially every naturally occurring phenomenon, as well as to the controlled enterprises of men on land. Knowledge of the nature of seasonal heat accumulation and depletion beneath heated and unheated structures, heavily traveled roads, and areas of disturbances resulting from grading and filling, furnish rational bases for improvement of engineering techniques. Formal solutions to problems of heat conduction in permafrost have been found, and simple graphical procedures obtained for determination of the thermal effects of buildings, the ocean, large lakes and roadways.

Marked advances have been made in the genetic classification of geomorphic features, soils, vegetation and animal populations. Proceeding from detailed studies of these features of the landscape in the Point Barrow area to extensive areas over the Arctic Slope, investigators have brought considerable order to the apparent chaotic complex of environmental features. Criteria for defining mapable units of these features have been established, considerable mapping accomplished, and the means provided for interpretation of less accessible regions by study of available aerial photographs.

Emphasis on biological and physical processes has yielded reliable information on the sequences of events leading through the development of the tundra ecosystem. Studies of such sequences provide a basis for inferring past history of areas and to a high order of predictability of future events, including consequences of disturbances. The broad outline of a system of cyclic changes in the ecosystem has emerged in relation to the formation and disappearance of thaw lakes peculiar to areas of permafrost. Biological productivity studies relate the economy of all plants and animals, including aboriginal man, to the environment and affords explanations of the limited economic potential of the land at high latitudes.

Biological survival in the Arctic has been studied largely by the physiological approach. Comparative studies of metabolism show some activity in plants at extremely low temperatures and indicate a lower threshold of activity in arctic than tropical mammals. Heat transfer from mammals has been shown to depend more on the protection afforded by pelagic than to thermal properties of fat or skin. Such studies coupled with observations of native populations and knowledge of abundance and distribution of food sources on land and sea are helpful in establishment of survival techniques.

Oceanographic studies have been oriented toward the objective of attaining data on the total marine environment. Over-ice meteorology of classical nature, as well as studies of radiation exchange, and other surface and near surface conditions, establish conditions for over-ice operations and for formation and dissipation of ice.

Studies of temperature salinity and biological populations provide considerable information on marine environments, food cycles, and the economy of the ocean. Plankton populations, as well as populations of animals dependent upon plankton for food, are much greater adjacent to floating fields of old ice. Dredging and sounding operations have established the bottom characteristics, including plant and animal populations, of inshore areas. Grounded pack ice has been shown to be an important factor responsible for micro-relief features on the sea floor. Coring the bottom sediments has provided information on stratigraphy of micro-fossils, particularly warm-and-cold-water foraminifera, which yield information on the shifting climate and distribution of ocean currents for Pleistocene and Recent time. Determination of ice characteristics, classification of ice types, and aerial photography of changing patterns of ice distribution provide bases for establishing paths of circulation, correlation of movement with meteorological and oceanographic parameters, and a methodology for ice forecasting which is essential to safe and efficient shipping operations.

Geological and paleontological studies have contributed data on history and development of the arctic landscape. Bedrock and glacial geology of parts of the Brooks Range and paleontology of the Cubic Formation and other Pleistocene deposits contribute importantly to earth history and accompanying climate and biological events.

Studies of magnetic and auroral phenomena contribute to the solution of disturbances to radio propagation and are leading toward improvements in communications and navigation systems.

Intensive studies of bacteria have demonstrated the nature of the total population in marine and freshwater environments and in varying organic and inorganic terrestrial substrates. Investigation of rates of food spoilage and organic decomposition, and the role of bacteria in sanitation and contamination of drinking-water sources, contribute to intelligent, safe and economical arctic operations.

The marked increase in activity over the Canadian and Alaskan Arctic during recent years has created innumerable problems requiring near miraculous solutions. In the field of arctic transportation this project has made important contributions to analyses of astronomical, meteorological and physiographic factors essential to successful operation in a difficult environment. Available compilations of data furnish the basis for

intelligent recommendations on transportation and related activities.

Concern for the welfare of Eskimo populations, thrown into increased contact with United States and Canadian government, industrial and private activites, has led to investigation particularly of the Eskimo's economic status and future. Results indicate that, whereas the Eskimo has adopted much that is desirable of white man's methods and goods, he has retained native habits and skills which will permit easy return to a subsistence type economy if and when payroll sources expire.

Photointerpretation. Methods for the photointerpretation of many features of geographic significance have been developed from studies made in selected representative areas. Among these methods are keys for the identification and interpretation of various types of landforms, including glacial landforms, coastal features, landforms in semi-arid regions, and landforms produced by wind. Also keys have been developed for identification of crop types at different stages of growth, seasonal variations in northern swamps and marshes, and for irrigation structures. Work is under way that will produce valuable guides showing changes in vegetation in southern and eastern Africa. Comparative photographs covering a span of close to 40 years will illustrate these changes. Research has been undertaken through the use of photointerpretation to delineate and develop an interpretive description of the geomorphic regions in Mexico. By comparing earlier maps and aerial photographs with current photos and field observations, shorelines of Lake Michigan have been classified according to rates and types of shore erosion and other changes. New methods of sampling and expressing terrain characteristics in quantitative, objective terms are being studied. A preliminary method of measuring terrain characteristics and relating these characteristics to features discernible on aerial photographs has been developed.

Coastal Geography. Research conducted under this project provides (1) a continuing supply of new and accurate geographic information on the coastal regions of the world, including ports and harbors, (2) a better understanding of significant coastal procedures and the relationship of phenomena, and (3) improved, rapid and adaptable techniques for acquiring, evaluating and presenting coastal data.

A wide variety of scientific and engineering skills, techniques, and procedures are employed. New methods are being developed and new applications are being made of standard techniques, particularly with regard to field observations, measurements, and photointerpretation. The research includes geographic analysis of specific types of coastal regions; geographic studies of little known coastal and island areas; studies of the world distribution and characteristics of significant coastal features; formulation of

geographic classifications and techniques for classifying world coastal areas; geographic studies of ports, including functions, special attributes, facilities, organization, traffic, transportation and relations to hinterland, and alternate ports; studies of coastal processes, forms, and rates and mode of development and change; development of graphic methods, appropriate symbols, and explicit nomenclature for improved depiction of coastal areas.

Research supported under this project has extended to many parts of the world -- the nature of the study varying from place to place according to the interests of the individual investigators who requested ONR support. The areas studied include the Gulf Coast of the United States, especially the Louisiana marshes, Outer Banks of North Carolina, Cape Cod, many islands and coastal areas of the Caribbean, the Guiana coast, many islands of Micronesia, Philippines, Madagascar, Bengal, and Bornholm.

Systematic and Regional Geography. The two principal accomplishments of current vintage under this program are: (1) the marked increase of field research in foreign areas by American geographers and (2) development of more precise methods of geographical research, especially through the application of statistical procedures.

Until two years ago this project had supported only three geographers in foreign field research, but in the past two years a total of eighteen have been supported. These eighteen are staying abroad for an average of one year. The reports produced by these field projects provide much valuable new data on insufficiently known areas. Perhaps of greater value to the field of geography in the long run, however, is the creation of a reservoir of competent geographers who have first-hand knowledge of foreign areas, who have established and will maintain personal contact with scientists and other key persons of foreign areas, and who, because of this field experience, will have greater competence and interest in additional foreign field research. The average age of these eighteen is 29 years. Seven more are now preparing to go abroad.

Several investigators have made great strides in bringing greater accuracy and objectivity into geographical research by application of statistical techniques. One program has concentrated on quantitative analysis of erosional topography. New techniques of morphometry of land surfaces have been developed and tested over a wide range of surface types. Methods of statistical analysis have been adapted to these new geomorphic data. Many relationships between landform dimensions and the controlling factors of climate, vegetation, relief, and rock type have been demonstrated. This research has resulted in a general modernization of this branch of geomorphology. In another study several techniques of statistical correlation have been tested to determine their relative value in measuring the degree of geographical or

spatial association. Improved cartographic procedures for analyzing spatial association have been devised. A study of principles and methods of geographic generalization has concentrated on the problem of representation of information at medium scales which at large scales, as on aerial photos, is exceedingly complex.

With support under the American Geographical Society this project has produced a general-purpose geographical handbook on Finland, and other volumes are nearing completion on Egypt, Pakistan, India, and Thailand.

Department of the Interior[116]

General Statement

The mission of the Department of the Interior is to foster conservation and development of natural resources. This mission, therefore, has strong implications to the geographer. The functions of the Department as performed by the several bureaus are generally functional or limited in scope and the reports of such work reflect this specialization. At times, however, more generalized studies are carried out which might be termed comprehensive. These usually relate to river basin "regions" and reflect the entire scope of the Departmental functions. This Department also participates in inter-agency studies such as the Arkansas-White-Red River Basin Studies. Some of the more conspicuous of all these studies are discussed in subsequent paragraphs.

Since 1952 there have been relatively fewer of these broader studies. More recently, however, there is a trend back to the comprehensive regional approach. This is consistent with water policy recommendations which recognize the value of intergovernmental comprehensive planning. There is, however, less emphasis on the river basin as the logical geographic region for planning. In some areas river basin boundaries may logically coincide with other regional considerations. There has recently been a recognition, particularly from studies in the eastern United States that water resources development is not necessarily the critical factor in regional growth. Thus, in New England, we see a logical regional unit defined by economic rather than physical boundaries.

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116 Except for the paragraphs on Geographical Nomenclature Research, this section was contributed by Lawrence N. Stevens, Acting Director of the Technical Review Staff of the Department of the Interior. Concerning the section Mr. Stevens says, "This is a summary covering reports and investigations of the Department of the Interior during 1953-57, which are of major importance to the understanding of the geography of the United States."

The Interior Department has participated wholeheartedly in the preparation of the new National Atlas series. This participation is destined to increase in the future and the resulting charts should be valuable to geographers everywhere.

Since it is difficult to segregate topical studies of natural resources which have general geographic significance, all such studies have been discussed in broad groupings. The reader having specific interest should, therefore, refer to more detailed listings and bibliographies. However, some examples of specific studies are mentioned in the following paragraphs.

Regional (Comprehensive) Studies

1. Regional program reports prepared by Departmental Field Committees have been continued on an annual basis. These reports describe regional program needs and analyze these needs as they relate to Interior's responsibilities. They generally project programs for six years into the future. Currently there are five regional field committees from which program reports have been prepared: Pacific Northwest, Pacific Southwest, Southwest, Missouri Basin, and Northeast. The Alaskan Field Committee has been inactive since 1953.

2. Since 1952 two important inter-agency studies have been completed. They are the Arkansas-White-Red Inter-agency River Basin Study and the New England-New York Inter-agency Study. These were discussed in Document 8 of the Third Pan American Consultation on Geography.

3. The Annual Reports series of the Interior Department give valuable data on the yearly accomplishments of the several bureaus. This information varies widely in scope but much of it has direct value to the student of geography. The latest report for 1957 fiscal year has not, at this date, been received from the printer.

4. Interior Department is participating in a re-study of the Delaware River Basin. The principal emphasis is on water resources; the study is directly organized as a project of the Corps of Engineers.

Special Reports

1. Several special reports were prepared during 1953-57 by Interior Department. They include the following:

a. Annual reports on administration of the Trust Territories.
b. "Colorado River Storage Project" by the Bureau of Reclamation (House Doc. 364, 83rd Congress, 2nd Session).
c. "Documents on Use and Control of Water in Interstate and International Streams."
d. "Impacts of Peaceful Uses of Atomic Energy on Coal, Oil and Natural Gas Industries 1955."

e. "Years of Progress 1945-52" (1953) for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.
f. "Natural Resources of Northwestern California" by the Pacific Southwest Field Committee (preliminary report).

2. The Department of the Interior was a major participant in the study of water resources policy during the period 1954-56. That study resulted in a report entitled "Water Resources Policy", a report of the Presidential Advisory Committee on Water Resources Policy. This policy document should have important influence on future development and conservation of water resources.

Resources Reports

Topical or limited-scope studies were completed on a wide range of natural resources problems during the period 1953-57. The quantity of these is in the thousands and they range widely in scientific and technical coverage. They can be generally grouped into four broad categories, examples of which are discussed below:

Public Lands. Two important reports on public land administration were published during this period as follows:

a. Fundamental Authorities for Federal Land Ownership and Management, 1956.
b. Information Relative to Use and Disposal of Public Lands and Resources in Alaska.

Extensive rehabilitation of Federal lands under the "Soil and Moisture" program was continued and accelerated during 1953-57. This work resulted in significant reduction in erosion and marked improvements to the range lands. Results of this work have been reported in numerous administrative reports.

Minerals. The important technical and scientific work of the Geological Survey and Bureau of Mines was continued during the period with increased stimulus supplied by growing public awareness of mineral problems. Findings of these studies were published primarily in the formal publications of those bureaus but considerable material was also published in technical and scientific journals. The reader should consult the publications list of those organizations for details.

The annual Minerals Yearbook Series has been continued. This series gives detailed information on the production of all mineral commodities and identifies geographic sources of production.

Mineral Facts and Figures, an encyclopedia of the minerals programs and their relation to the programs of the Department of the Interior, was released in 1953. It provides a valuable reference for understanding mineral resources economics.

Many publications of the Geological Survey report on cooperative investigations with other American countries. Among these are reports on ferrous mineral resources of Brazil and Mexico.

New geologic maps of Oklahoma, Montana, Wyoming and New Hampshire were published, and new maps giving locations of such resources as coal, oil and gas, iron and uranium were also published.

A reappraisal of the coal resources of the United States had been carried on vigorously, and several reports giving areal results have been published.

Water Resources. Extensive findings in water resources investigations were also published during the period. These were chiefly in the Geological Survey Water Supply Paper series and circulars. Some additional information, particularly on Saline Water Conversion, was published. These findings range from statistical tabulations of basic data to analysis and research in complex hydrologic problems. Here again publication of some information in technical and scientific journals is commonly practiced.

Publication of a study of water use in the United States 1955, USGS Circular 398, is an effort of considerable interest.

A symposium on Saline Water Conversion was held in Washington, D. C., December 4-10, 1957. Many interesting and valuable papers were presented on this subject. The proceedings of the meeting will be published under the sponsorship of the National Academy of Sciences.

A series of reports on water requirements of specific industries is well along toward completion and several reports have been issued, such as those for the pulp and paper and the aluminum industries.

A series of reports on the water resources of industrial areas has been nearly completed. Eventually this series will cover all important industrial areas in the United States.

A reappraisal of the water-power resources of the United States was made.

Fisheries and Wildlife Research. Many valuable papers on this subject were published during 1953-1957. These range in nature from statistics of commercial fisheries to findings of research. In scope they vary also from detailed and highly specialized subjects to relatively comprehensive reports. Among the latter are the following:

a. Use of Impounded Water for Fish Culture
b. Feeding Mechanism of the Sea Lamprey and its Effect on Host Fishes
c. National Survey of Fishing and Hunting
d. Yellowfin Tuna Spawning in the Central Equatorial Pacific
e. Fishes of the Gulf of Maine
f. Waterfowl Populations and Breeding Conditions, Summer 1955 (joint effort of U. S. and Canada).

Geographical Nomenclature Research

At least 30 geographers are employed in the Office of Geography, but the number fluctuates considerably from year to year. Most of them (Grades 5 to 14) are in the Board on Geographic Names, and are employed on contract funds from other departments of government. These geographers are engaged in geographical names research. The Board on Geographic Names, an interdepartmental agency, has the responsibility of determining and standardizing geographical place names for use by all federal government agencies. Actually, the Board on Geographic Names is made up of members from the Departments of Agriculture, Air Force, Army, Commerce, Interior, Navy, Post Office, State and the Central Intelligence Agency, Government Printing Office and the Library of Congress.

Standardization of geographical place names has been carried on continuously since 1890 by the Federal Government, but on a restricted basis until 1943. The Board has standardized by approved research procedures well over a million geographical place names, covering nearly all parts of the world. These names are being continuously maintained and as new information is obtained, they are brought up to date. The many Special Publications of the Board on Geographic Names on "Directions for the Treatment of Geographical Names" of various countries are well known.

Department of State[117]

Two offices in the Department of State are exclusively engaged in geographic activities. One falls into the category of cartographic documentation; the other can be associated with the field of political geography and includes the practical application of cartography. In both instances the geographic activities definitely extend into other government departments, and also are professionally linked with the general field of geography as it exists internationally as well as nationally. The two offices are independent of each other organizationally but cooperate closely on problems of mutual interest.

Office of the Coordinator for Maps

The Department of State conducts a world-wide map procurement program, not only for its own use, but also on behalf of the various mapping organizations of the United States Government. This program is directed by a professional geographer, Dr. Arthur L. Burt, who is the Department's Coordinator for Maps. Under his direction are a number of Geographic Attaches

[117] This section was contributed by Dr. Arthur L. Burt and Dr. G. Etzel Pearcy.

who are assigned to American Embassies in certain cities and who work on a regional basis, usually involving a block of countries. Requirements demand that these Geographic Attaches have sound training and background in cartography and geography, and normally they are men with many years' experience in these fields. The program has been in operation since 1946 and has gone a long way toward establishing exchange relations between the Department of State and the Library of Congress on one hand, and numerous foreign mapping agencies on the other.

Among the Geographic Attaches, Mr. Arthur P. Biggs has served in Latin America since 1946, with an interruption of only two years (1953-55) when he was assigned to the Embassy in Cairo. At the present time he is stationed in Buenos Aires, but visits the several countries of Latin America, meeting with mapping officials, facilitating exchanges, and purchasing maps.

In addition to his responsibilities as Coordinator for Maps, Dr. Burt is responsible for the handling of all professional matters within the Department which relate to the Commissions on Cartography and Geography in the Pan American Institute of Geography and History. This involves participation as an ex-officio member of Advisory Committees to the United States members, contacts with the members themselves, and related activities.

Office of the Geographer

The activities of the Office of the Geographer are centered upon the political geography of the foreign relations of the United States, and break down into questions on sovereignty, international boundaries, geographic nomenclature, and associated topics. The office is operated by two professional geographers: Dr. G. Etzel Pearcy, Geographer, and Dr. Robert D. Hodgson, Assistant Geographer.

The small size of the staff of this office precludes sustained research projects on matters of political geography. Rather, the work consists of assembling and keeping up to date pertinent geographical data of interest to the United States Government in matters dealing with its international relations. On a functional basis the work of the office can be roughly classified as follows:

1. Service to various divisions of the Department of State, including the Consular and Legal bureaus. For example, complete records are maintained on the geographical description of all United States Consular Districts. Again, there is close contact between the Office of the Geographer and regional specialists on matters involving issues of sovereignty and boundaries, especially in instances of "problem areas".
2. Liaison with other government offices, especially for clearance of approved geographic and cartographic policies:

Department of Commerce, Department of the Interior, Department of Defense, etc.[118]

3. Promotion of the field of Geography by relationships with professional academic societies and Departments of Geography in universities.
4. Courtesy service to commercial organizations and individuals interested in and desiring information on politico-geographic matters for which the office has available data.

The office is equipped only with a minimum reference and map library, but has access to these facilities in several associated bureaus. However, the office is organized in such a way that it is normally able to furnish on quick call background and factual information relative to areas in the world which may have critical politico-geographic problems. Publications, both cartographical and geographical, are intermittently released, but distribution is limited to government organizations.

The Geographer and Assistant Geographer are on various committees as representatives of the Department of State. These include the Board on Geographic Names, the Technical Antarctic Committee, and the Air Coordinating Committee. Likewise, either member of the office staff may be assigned to any project as the Department representative, or as a representative for any division within the Department.

The Legislative Branch of the Government[119]

Geographers and Their Work

At least 24 professionally trained Geographers are employed in the Legislative Branch of the Federal Government. Only two of them (the Chief and Assistant Chief of the Map Division of the Library of Congress) are officially classified as Geographers, but the others are applying effectively their geographic knowledge and training to a wide variety of administrative, advisory, bibliographical, research, and technical positions.

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118 Footnote added by Clarence F. Jones. Administratively the International Cooperation Administration is attached to the Department of State. ICA has a few professional geographers in administrative and investigative positions at fairly high levels. Its international cooperative development projects in foreign countries carry on an enormous amount of geographic research on many areas. There is a need in ICA for many more professional geographers at several levels.

119 This section was written by Arch C. Gerlach.

All but one of the Geographers in the Legislative Branch of the Government are employed in the Library of Congress. The exception is Dr. John L. Taylor who is a Consultant on both Indian Affairs and on Territories and Insular Affairs for the House of Representatives Committee on Interior and Insular Affairs.

In the Library of Congress Geographers occupy 13 positions in the Map Division, including a Chair of Geography occupied by the Division Chief (Dr. Arch C. Gerlach), the Assistant Chief (Dr. Walter W. Ristow), the Bibliographer (Mrs. Clara E. LeGear), the Head of the Map Acquisitions Section, four reference assistants and five processing assistants. In the Map Division is located (since 1951) the Central Office of the Association of American Geographers. A former Chief of the Map Division, Dr. Burton W. Adkinson, was until early 1958 Director of the Reference Department which includes nearly a score of specialized Divisions in addition to custody and service of the general collections of the Library, now totalling more than 35,000,000 items. A degree in Geography is also held by the Acting Chief of the Science Division of the Reference Department. In the Legislative Reference Service of the Library Dr. John K. Rose serves as a Senior Specialist on Conservation. In Contract Divisions of the Library, supported by other agencies to perform research based on reference materials in the Library of Congress, are eight Geographers who serve as area or subject specialists and as photointerpreters. In addition, 6 to 12 graduate students in Geography have received temporary appointments during each of the past seven summers to supplement the work of regularly employed Geographers in the Library.

Employees of the Legislative Branch of the Government are permitted, and even encouraged to carry on private research and publication in professional journals, and many of them do so. Publications prepared on office time as part of their official duties are normally released through the Government Printing Office or the agency in which the Geographers are employed. A list of the publications prepared in the Map Division of the Library of Congress can be obtained without charge by writing to the Division Chief.

Special Publications of the Map Division 1952-1957

1. Clara E. LeGear, A List of Geographical Atlases in the Library of Congress, Vol. 5, 1957; Vol. 6, in compilation.
2. United States Library of Congress, Subject Cataloging Division, Classification, Class G: "Geography, anthropology, folk-lore, manners and customs, recreation," 3rd edition, Washington, 1954.

3. Charles W. Buffum (editor), Catalog of National Exhibits, Seventeenth International Geographical Congress, Washington, D. C. Washington, 1952.
4. Marie C. Goodman and Walter W. Ristow, Marketing Maps of the United States; An Annotated Bibliography, Second (revised) edition, Washington, 1952, 100 pages.
5. Walter W. Ristow and Clara E. LeGear, A Guide to Historical Cartography, Washington, 1954, 14 pages.
6. Clara E. LeGear, Maps, Their Care, Repair and Preservation in Libraries, Washington, 1956, (revised edition), 75 pages.
7. J. Douglas Hill and Richard S. Ladd, Treasure Maps in the Library of Congress; An Annotated List, Washington, 1955, 24 pages.
8. Arch C. Gerlach, Annual Map Production Tabulated by Countries, Appendix to Library of Congress Information Bulletin, April 18, 1955, 2 pages.
9. Arch C. Gerlach, "Potential Uses of Government Libraries for Geographical Research," Journal of Geography, Vol. LII (January 1953), pp. 32-40.
10. Arch C. Gerlach, "Reports on Exhibits at the VI Assembly, Pan American Institute of Geography and History, Mexico City," Reprint Map Library 1955, 14 pages.
11. Walter W. Ristow, "What About Maps? A Review of Literature on Map Librarianship for the Period 1946-55," Reprinted from Library Trends, October 1955.

Executive Office of the President

Certain bureaus, offices, or agencies in the Executive Office of the President engage in studies of a geographic nature to meet intelligence requirements. For the agency, which perhaps does more geographic intelligence research than any others in this group, no figures are available on the number of geographers employed and no information is available on the specific kinds of work done.

The Bureau of the Budget has employed geographers in one capacity or another since the late 1930's. The Fiscal Analysis and Estimates Divisions still use geographers and others in the research of independent commissions on particular policy problems. For many years Robert H. Randall of the Estimates Division has had the responsibilities of coordinating certain mapping and surveying activities of several federal agencies and of serving as liaison in cartographic and geographic matters between federal agencies and the agencies in Latin American countries. For years the Natural Resources Public Works Branch of the Fiscal Analysis Division has been making studies on long-range domestic policies for Federal action relating to water, land, and other natural resources.

Federal Civil Defense Administration

The Federal Civil Defense Administration provides another field in which the concepts and experience of the geographer are finding useful application. The FCDA is charged with providing guidance and coordination for State and local planning groups responsible for drafting plans to cope with the evacuation, medical, commissary and shelter and related problems anticipated in large urban areas in the event of an atomic attack. Effective solution of emergency problems of this nature demands careful analyses of the functioning of urban communities under normal circumstances. These analyses involve a detailed study of urban land use patterns, of population distribution, and of the location and characteristics of the various types of urban functions such as industrial, transportational, commercial and institutional. For many urban centers such information is available in usable form, in others it must be assembled by local civil defense authorities. The function of the FCDA is to assist local groups in preparing to meet the emergencies that might reasonably be anticipated and to coordinate activities of such groups in the principal densely populated areas that extend across state boundaries. This agency also attempts to point the way to effective solution of the varied problems of civil defense by giving guidance in estimating the magnitude and character of the land for emergency shelter, evacuation facilities, medical care, food and police and fire protection. It is evident that all professional groups engaged in the study of urban populations, city planning and management, including urban geographers, can make useful contributions toward preparing adequate plans for minimizing the casualties and damage to property incident to an atomic attack.

Other Federal Agencies and International Organizations

The above should be looked upon as only a summary of the geographical research that is being engaged in by government agencies. There are several other agencies that, although they employ a few geographers, do much work of a geographical nature A few examples may be mentioned. In the Cartographic Records Division (of the National Archives), which is responsible for specialized work on all of the cartographic, photogrammetric and related records of the Federal Government, professional personnel are selected on the basis of qualifying as geographers with major work in historical geography, American History and related social sciences. Here professional grades range from GS-5 to GS-14. Although the Tennessee Valley Authority employs few geographers, compared with the number employed in the 1930's,

it constantly does work of a geographic nature.[120] The Smithsonian Institution sponsors many studies of high quality from the geographic point of view. One example out of many is Felix Webster McBryde's, "Cultural and Historical Geography of Southwest Guatemala," Smithsonian Institution, Institute of Social Anthropology, Publication No. 4, Washington, 1945, pp. xv and 1-184.

It is well known that several international organizations, in which the United States government participates actively, are continuously engaged in research on various aspects of geography. The several agencies of the United Nations, as a group, perhaps lead all others in the volume of research and publication. To mention only a few, other important ones are the Pan American Union, Pan American Institute of Geography and History, The International Bank for Reconstruction and Development, and the Inter-American Geodetic Survey.

Geographers and Their Work in State, County and Municipal Governments

The employment of considerable numbers of geographers by state, county and municipal governments is relatively recent, and one of the outstanding developments in geography in the United States. It is believed that prior to World War I not a single professional geographer as such was employed full-time by a state or city government. Of course, some geomorphologists and geologists had prepared resource surveys for a few state governments. Following World War II, the earliest state-sponsored field studies of land use that made use of professional geographers was the Michigan Land Economic Survey, which began in 1922. This project was developed because of a need for adequate field data upon which to base a state-sponsored program for the best use of cut-over and other lands in northern Michigan for agricultural, recreational, or other uses. This survey used topical specialists to classify soil quality, slope, vegetation, and other natural conditions, as well as various uses of the land, but in addition it employed geographers to do field mapping and to analyze the data gathered.[121] The many problems encountered in this survey stimulated thinking (on the part of geographers and others) with regard to special methods and field techniques for the classification of various types of land. The Michigan Land Economic Survey continued for several years and out of it came several

120 Edward A. Ackerman, "Regional Research -Emerging Concepts and Techniques in the Field of Geography," Economic Geography, Vol. 29 (1953), pp. 189-197.

121 Carleton P. Barnes, "Land Resource Inventory in Michigan," Economic Geography, Vol. 5 (January 1929), pp. 20-23.

studies on methods of land classification.[122] Other methods and field techniques grew out of the work of geographers elsewhere.[123] In the depression years of the 1930's several states made an inventory or classification of their lands, but in general these were not made by geographers.[124] However, a few geographers found employment in this period in state planning boards.

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122 J. O. Veatch, "Natural Geographic Divisions of Land," Papers of the Michigan Academy of Science, Arts, and Letters, Vol. XIV (1930), pp. 417-432; Lee Roy A. Schoenmann, "Rural Planning in Alger County," Papers of the Michigan Academy of Science, Arts, and Letters, Vol. XVI (1931), pp. 329-361; J. O. Veatch, "Classification of Land on a Geographic Basis," Papers of the Michigan Academy of Science, Arts, and Letters, Vol. XIX (1933), pp. 359-365; J. O. Veatch, "The Idea of the Natural Land Type," Proceedings of the Soil Science Society of America, Vol. II (1937), pp. 499-503; Mary Caroline Sterling, "Land Types in Emmet County, Michigan," Papers of the Michigan Academy of Science, Arts, and Letters, Vol. XXIV (1938), pp. 55-59; Fred W. Foster, "Farmsteads and Land Types in Emmet County, Michigan," Papers of the Michigan Academy of Science, Arts, and Letters, Vol. XXVII (1941), pp. 351-367.

123 Wellington D. Jones and Vernor C. Finch, "Detailed Mapping of an Agricultural Area," Annals of the Association of American Geographers, Vol. 15 (1925), pp. 148-157; Vernor C. Finch, "Montfort - A Study in Landscape Types in Southwestern Wisconsin," Bulletin of the Geographic Society of Chicago, Vol. IX (1933); Charles E. Kellogg, "A Method of Rural Land Classification," Technical Bulletin No. 469, United States Department of Agriculture, February, 1935, pp. 1-28; G. Donald Hudson, "The Unit-Area Method of Land Classification," Annals of the Association of American Geographers, Vol. 26 (1936), pp. 99-112; G. Donald Hudson, "Methods Employed by Geographers in Regional Surveys," Economic Geography, Vol. 12 (1936), pp. 98-104.

124 The following are examples of several such studies: T. E. La Mont, "Land Utilization and Classification in New York," Cornell Agricultural Extension Bulletin No. 372, 1937; John S. Bordner and others, "Land Economic Inventory of the State of Wisconsin," Division of Land Economic Inventory, No. 4 (June 1936), pp. 1-32; W. L. Gibson and Farrar V. Shelton, "Economic Land Classification of Pulaski County," Bulletin 398, Virginia Agricultural Experiment Station, Blacksburg, (June 1946), pp. 1-12.

Despite all the interest the above works created among geographers, despite all the work of land classification and of planning in various states and in the Federal Government, and despite the many studies made by academic geographers in rural and urban land classification and use, few geographers found full-time employment in state, county, or city governments between 1930 and 1950. Even in early 1952 only 24, or 1.8 per cent, of the members of the Association of American Geographers for whom employment status was known, were employed by state and city governments.[125] However, this small number then represented about 7 per cent of the geographers employed in all types of government agencies. Geographers on the whole still had not fully convinced state and local officials of the contributions they could make to many of the problems these officials faced. However, there are a few outstanding exceptions. For example, Dr. Rafael Picó largely through his own efforts in the early 1940's organized and from 1942 to 1953 served as Chairman of the Puerto Rico Planning Board, which has been regarded for years in geographic and planning fields as being a model of its kind. In addition to its own many contributions to geography, the Board was one of three Puerto Rican agencies that sponsored The Rural Land Classification Program of Puerto Rico, 1949 to 1952.[126]

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[125] Louis Peltier, "Analysis of Membership of the Association of Professional Geographers," The Professional Geographer, Vol. IV (July 1952), pp. 2-4.

[126] For the period of the Program Dr. Picó served as a member of the Steering Committee; for most of the period two geographers worked on it full time; a geographer directed the whole Program; and 18 doctoral candidates in geography did the mapping on aerial photographs, scale 1:10,000, of land use and physical characteristics for the island. For details of this work and some of the geographic studies resulting from it see, Clarence F. Jones (co-author and editor), "The Rural Land Classification Program of Puerto Rico," Northwestern University Studies in Geography No. 1 (1952), pp. 1-261; Clarence F. Jones and Rafael Picó (editors), Symposium on the Geography of Puerto Rico, University of Puerto Rico Press, Rio Piedras, 1955, pp. xxviii and 1-503; Carl L. Swisher, "Agricultural Development Regions and Subregions of Puerto Rico," Ph. D. Dissertation, Department of Geography, Northwestern University, 1958, pp. 1-227. For uses made of the data gathered in this Program see, Clarence F. Jones and Hector Berrios, "Report on the Rural Land Classification Program of Puerto Rico, 1949-1952," Revista Geografica, Tomo XVIII (1 Semestre de 1956), pp. 23-40.

Since 1952, the employment of geographers in state and local government agencies has increased moderately. In 1956 the number so employed was 45, or 2.6 per cent of the members of the Association of American Geographers, for whom data on employment status are known (see Table XIII). However, relative to the total number of members of AAG the situation is roughly the same as it was in 1952, for the geographers so employed in 1956 constitute only 2.3 per cent of the members and 10 per cent of those employed in all types of government agencies. It should be pointed out that the above figure of 45 is too low, because the writer knows personally at least 40 geographers working for state and local government and who are not members of AAG.

In recent years some geographers have convinced a number of state and municipal officials of their capabilities with respect to several types of problems facing them.[127] Most states, many cities, and some counties have active planning agencies, and many of them employ professional staffs -- specialists trained in several disciplines, such as engineering and architecture on the one hand and economics, sociology, political science, and geography on the other hand.[128] Geographers are assisting several state and county governments with conservation activities. They are

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127 A few examples illustrating the types of studies that have been made, and are being made, with geographers as part of the research team are the following: Harold V. Miller, "The Growth and Development of the Morristown, Tennessee Community," Bulletin of the American Society for Professional Geographers, Vol. 8 (December 1948), pp. 28-40; Charles A. Blessing and Harold M. Mayer, "The Calumet Industrial District: A Preface to a Comprehensive Plan," Chicago Planning Commission, 1942; Victor Roterus, Industrial Land Use: Present and Future, Cincinnati City Planning Commission, 1946; Industrial Land Use for Philadelphia in Relation to Metropolitan Development, Philadelphia City Planning Commission, Philadelphia, 1950; "Where Two Great Waterways Meet," Biennial Report No. 1, Chicago Regional Port District, Chicago, 1953; "The Calumet Area of Metropolitan Chicago," Chicago Planning Commission (December 1956), pp. xiv and 1-73; Metropolitan Area Problems in Northeastern Illinois," Part 1 - Analysis, Section A, Northeastern Illinois Metropolitan Area Local Governmental Services Commission, Chicago, 1956. Space permitting, many other examples could be cited.

128 Harold M. Mayer, "Geographers in City and Regional Planning," The Professional Geographer, Vol. VI (May 1954), pp. 7-12.

engaged in office research or field work on the use and classification of land, in analyses and evaluations of the geographic bases of state economy, in research and mapping of population distribution and groups, and in analyses of state industrial, agricultural and transportation enterprises. Most of the geographers employed by municipal governments are engaged in field and other research and in making maps for use primarily for planning programs, but a few are making studies of the many kinetic relations of the central city to its suburbs in large metropolitan areas. The evidence in hand seems to indicate that the opportunities for employment of geographers in such activities as the above will increase considerably in the next decade.

PART III GEOGRAPHERS EMPLOYED IN BUSINESS AND THEIR WORK

It is believed that prior to World War I not more than six professional geographers had full-time employment in business organizations, and all of these were in map and magazine publishing concerns. During World War I 20 or more professional geographers from the young growing university departments and from the American Geographical Society demonstrated in the short space of two years the geographers' capabilities.[129] Nevertheless, most of these geographers returned to their former posts in the immediate post-war period; however, a few entered the business world. Between the two World Wars only a few additional geographers accepted full-time employment with business organizations. In this period few geographers were aware of the various ways they could effectively serve business, and likewise most businessmen were not cognizant of the kinds of service that men trained as geographers could give them. In the mass exodus of geographers from Washington following World War II, more additional geographers entered business concerns than had been employed by such organizations up to that time. These and other

[129] During World War I leading geographers were employed in the Shipping Board, the War Trade Board, and in the Intelligence Division of the Army; also several leading geographers played an important part in the preparations for the Paris Peace Conference and Dr. Isaiah Bowman made outstanding contributions at the Conference. For a brief account of the part the American Geographical Society, Dr. Isaiah Bowman and at least three other geographers played in gathering and preparing data for the Paris Peace Conference, see John Kirkland Wright, Geography in the Making: The American Geographical Society, 1851-1951, published by the Society, New York, 1952, pp. 199-203.

geographers engaged in war work had demonstrated to hundreds of businessmen also involved in war work in Washington the kinds of things that geographers are capable of doing. As pointed out above, the pioneer business geographer was engaged primarily in publication. New fields entered just before and immediately after World War II were particularly product market analysis, store location studies, industrial plant research and planning.[130]

In early 1952 nearly 100, or 7.4 per cent, of the members of the Association of American Geographers for whom occupational data were known were engaged in business, commerce and industry, library and archives and publication in that order; in addition 3.3 per cent were engaged in private research.[131] Thus, in less than a decade new positions, of which many involved new types of work, opened up in the business field for geographers. In two years prior to March 1953 the Newsletter of the American Society of Planning Officials listed 245 open positions in the planning field. Of these vacancies possibly one-fourth could have been filled effectively by geographers.[132]

In early 1956 nearly 200, or 11.3 per cent of the members of the Association of American Geographers for whom occupational data were known were employed in business organizations (see Table XIII). Thus, in six years, the number employed in business increased by 100, or a 100-per-cent increase. Actually, the increase was greater than this because the writer knows personally 50 geographers who work in business concerns but are not members of AAG.

As a group, geographers employed in business are spread among a wide variety of concerns and carry on work in many as-

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130 Harold V. Miller, "Some Uses of the Geographic Background in Guiding the Location of Industries," Bulletin of the American Society for Professional Geographers, Vol. 6 (December 1947), pp. 17-22; William Applebaum, "The Geographer in Business and His Requisite Training," Bulletin of the American Society for Professional Geographers, Vol. 5 (April 1957), pp. 1-4; William Applebaum, "Marketing Geography," in American Geography: . . . op. cit., pp. 245-251; Harold V. Miller, "Training Geographers for Planning," The Journal of Geography, Vol. XLVII (May 1948), pp. 177-183. See also, William Glenn Cunningham, The Aircraft Industry: A Study in Plant Location, Lorrin L. Morrison, Los Angeles, 1951, pp. xvi and 1-247.

131 Louis Peltier, op. cit., Vol. IV (July 1952), pp. 2-3.

132 The Professional Geographer, Vol. V (March 1953), p. 8.

pects of geography. About half of those in the "other" category under business in Table XIII are in capital investment analysis.[133] Of those in the "libraries and institutes" category more than half are employed in research;[134] the others are special librarians, Those in the "mapping and cartography" category are individuals or groups of individuals employed for this work by manufacturing, transportation, tourist, etc., companies other than publishing concerns. Between 1952 and 1956 the number engaged in publication increased by at least 52 per cent. More than half of these are geographic-cartographers in map companies,[135] magazine publishers,[136] and book companies; several had editorial positions; several are research analysts and writers; others are administrators or business managers.

Judging from employment status data given in the Handbook-Directory 1956 of AAG, about 50 per cent of the geographers then

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133 Lawrence Kratz, "Geography and Municipal Board Analysis," The Journal of Geography, Vol. XLIX (September 1950), pp. 255-256; Harold M. Mayer, "Lake County Indiana," A Report Submitted to the Lake Mortgage Company, Gary, 1954; Dennis Durden, "Economic Geographers as Investment Consultants," The Professional Geographer, Vol. IX (January 1957), pp. 14-16.

134 There are several institutes (which employ some geographers) that do much research of a geographical nature. One example of such work is, Diana Rowley (editor), Arctic Research: The Current Status of Research and Some Immediate Problems in the North American Arctic and Subarctic, Arctic Institute of North America, Special Publication No. 2, 1955, 266 pages.

135 Like the Aeronautical Chart and Information Center at St. Louis and other government agencies, map publishing companies have found the work of cartographers with a background training in geography especially valuable in the business of compiling, designing, drafting and editing all kinds of maps. See Richard Edes Harrison, "Cartography in Art and Advertising," The Professional Geographer, Vol. II (November 1950), pp. 12-15; Carl Mapes, "Cartography in Map Companies," ibid., p. 16; Clarence B. Odell, "Cartography and Cartographers in Commercial Map Companies," ibid. pp. 17 - 19; Clarence B. Odell, "The Needs of Private Industry in the Training of Cartographers," The Professional Geographer, Vol. III (September 1951), pp. 9-11.

136 For example, The American Geographical Society of New York and the National Geographic Society employ several geographers and cartographers each; also Time, Holiday and other magazines employ one or more geographers.

employed in business were engaged as research analysts, consultants, or planners. It should be understood that many, if not a great majority, of the consultants and planners actually carry on research, and also make maps. Several geographers are employed by railroad companies to engage in research on industrial plant location and on transportation.[137] Geographers have been successful, and still are, in what is now called "marketing geography" for several chain stores in searching for possible locations of new stores. These studies involve all the varied aspects of stores, such as size, type of service, source of customers, sites, traffic flow, trading area, parking facilities, and the impact of suburban expansion upon store location.[138] They involve not only much geographic field work, but also the analyses of the excellent basic studies made by local government and other private agencies - studies that provide data directly applicable to store location and analysis.[139] Some automobile and several other manufacturing companies employ geographers as market research analysts. Most of the geographic research and reports for these and others

137 The following two articles illustrate one type of transportation study: Albert G. Ballert (now Director of Research for the Great Lakes Commission), "The Great Lakes Coal Trade: Present and Future," Economic Geography, Vol. 29 (1953), pp. 48-59; Albert G. Ballert, "Commerce of the Sault Canals,: Economic Geography, Vol. 33 (1957), pp. 134-148.

138 Saul B. Cohen, "Team Research in Marketing Geography," The Professional Geographer, Vol. VIII (September 1956), pp. 5-8; see also, Howard L. Green, "Hinterland Boundaries of New York City and Boston in Southern New England," Economic Geography, Vol. 31 (1955), pp. 283-300.

139 Illustrative of these kinds of data are five publications, containing eight reports dealing with various aspects of business and parking, the National Academy of Sciences-National Research Council: (1) Parking as a Factor in Business, Highway Research Board Special Report 11, NAS-NRC Pub. 273, Washington, 1953; (2) Shopper Attitudes, Highway Research Board Special Report 11-A, NAS-NRC Pub. 273a, Washington, 1955; (3) Shopping Habits and Travel Patterns, Highway Research Board Special Report 11-B, NAS-NRC Pub. 273b, Washington, 1955; (4) Parking and Buying Habits of a Store's Customers, Highway Research Board Special Report 11-C, NAS-NRC Pub. 273c, Washington, 1956; (5) Parking and Its Relationship to Business, Highway Research Board Special Report 11-D, NAS-NRC Pub. 273d, Washington, 1956. See also C. T. Jonassen, "The Shopping Center Verus Downtown," Bureau of Business Research, College of Commerce and Administration, Ohio State University, Columbus, 1955, pp. xviii and 170.

are made available for internal company use only. It is estimated that at least 50 geographers are now employed in research, cartographical and statistical presentation, and analysis for several private companies engaged in studies of industrial plant location, individual store and whole shopping center locations, transportation problems and many other types of investigations. Examples of a few of these companies are Larry C. Smith and Company with offices in Seattle, Washington and Washington, D. C.; Evert Kincaid and Associates, Chicago; Battelle Memorial Institute, Columbus, Ohio; Donald J. Belcher and Associates, Ithaca, New York; Homer Hoyt Associates, Puget Planners, Inc., Seattle; Community Planning and Development (Eggerding) Inc., Valparaiso, Indiana; Johnson, Albrecht and Mann, Clearwater, Florida. The special research and reports by these companies are generally done under contract and made available only for use by the concern contracting for the job. However, some of these reports have become available to this author.[140]

The above discussion and references indicate that the work of geographers in business concerns varies from detailed studies of small areas or restricted topics to analyses of the very complex intra-relations of physical, economic and cultural conditions of large metropolitan areas or of kinetic relations of such areas to their tributary regions, and even to the evaluation of factors of potential development of a whole river basin within one to several states. These studies have advanced techniques of field mapping, library research, and analyses and presentation of empirical data, but geographers engaged in such work in general have not projected hypotheses and repeatedly tested them statistically in the development of geographical theory. These geographers and other scientists associated with them are fully engaged in making one

140 The following are only a few examples: Ernest E. Melvin, Plans for Downtown Gary: A Parking Study, Evert Kincaid and Associates, Chicago, 1955; Ernest E. Melvin and Dean A. Davis, Background Factors and Preliminary Plans for Pontiac, Illinois, Evert Kincaid and Associates, Chicago, 1956; Ernest E. Melvin and Dean A. Davis, A Preliminary Plan for Momence, Illinois, Evert Kincaid and Associates, Chicago, 1956; Thomas D. Best, The Economic Potentialities of the Upper Ohio Valley, Battelle Memorial Institute, Columbus, 1955; Thomas D. Best, Economic Appraisal of Tuscarawas County, Battelle Memorial Institute, Columbus, 1956; Schools for Bellingham (Map series of Bellingham, Washington, scale one inch equals one mile), Puget Planners Inc., Seattle, 1954; Economic Survey of Montgomery and Prince Georges Counties, Maryland, Homer Hoyt Associates, Silver Spring 1955, pp. vii and 309.

study after another to be used in solving more or less pressing problems. Thus, the development of theory has been left largely to geographers and others in the academic field.[141] Geographers have given good service to business organizations, and wherever they have done so they have created new openings, thus broadening considerably their field of service to business concerns. The demands in the business world for persons trained as geographers to perform the kinds of tasks mentioned above are increasing each year. It is estimated that an average of 50 or more new positions that geographers can effectively fill in business organizations may well open up each year for the next decade.

Two Significant Recent Trends in Geography

The report above has pointed out in some detail that practically all aspects of geography -- academic and other -- have expanded greatly. With all the study that has been necessary in the preparation of this report, the writer has come to the conclusion that the two most significant trends in the whole field of geography during the past several years are (1) the practical application of research and geographical information to many kinds of problems, and (2) the increasing attention devoted to statistical analysis of geographical data and rigorous testing of theory.

In the preceding pages of this report much attention has been given to the practical application of research and geographical information to numerous problems faced by international, federal, state, and local governmental agencies and by the many business concerns that employ geographers. In addition, many publications dealing with such subjects have been cited. In reality, although there may be some striking exceptions, the great bulk of the geographical research undertaken by governmental agencies and business organizations is for the purpose of increasing the efficiency of operations or the effectiveness of the utilization of resources, both natural and human, with the most modern technical knowledge and equipment available.

In the preceding pages little has been said about the increasing attention given to statistical analysis of geographical data and the testing of theory; although reference has been made to them. Statistical, or quantitative, investigations in geography are not

141 It should be pointed out that a few geographers in business in recent years have had time and energy to prepare articles for publication. For example: Howard L. Green, "Hinterland Boundaries . . . " op. cit., pp. 283-330; Wilbur Zelinsky, "A Method for Measuring Change in the Distribution of Manufacturing Activity: The United States, 1939-1947," Economic Geography, Vol. 34 (1958), pp. 95-126.

new. Since the early days of geography in the United States, agricultural, climatic, demographic, manufactural, mineral and other statistics have been basic for much geographic research and analysis. The new trend involves the attempts by several geographers to apply mathematical equations, or special statistical techniques, to geographical data in order to develop meaningful generalizations with respect to spatial regularities of geographical phenomena and quantitative systematic relations between them. Studies involving these methods have dealt with statistics on population, cities, manufacturing, transportation, retail sales, agricultural production, and others. These studies by geographers are similar to those done earlier (and still being done) by other scientists, such as John Q. Stewart,[142] associate professor of astronomical physics at Princeton University; Walter Isard,[143]

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142 See the following articles by John Q. Stewart: "Empirical Mathematical Rules Concerning the Distribution and Equilibrium of Population," Geographical Review, Vol. 37 (1947), pp. 461-485; "Demographic Gravitation: Evidence and Applications," Sociometry, Vol. II (1948), pp. 31-58; "The Development of Social Physics," American Journal of Physics, Vol. 18 (1950), pp. 249-253; "Potential of Population and Its Relations to Marketing," in Theory in Marketing, edited by Reavis Cox and Wroe Alderson, (Chicago 1950), pp. 19-40; John Q. Stewart and William Warntz, "Macrogeography and Social Science," Geographical Review, Vol. XLVIII (1958), pp. 167-184.

143 Walter Isard, "Some Locational Factors in the Iron and Steel Industry Since the Early Nineteenth Century," Journal of Political Economy, Vol. LVI (1948), pp. 203-217; "The General Theory of Location and Space-Economy," Quarterly Journal of Economics, Vol. 63 (November 1949), pp. 476-506; "Distance Inputs and the Space Economy," Quarterly Journal of Economics, Vol. LXV (May 1951), pp. 181-198, and Vol. LXV (August 1951), pp. 373-399; "Interregional and Regional Input-Output Analysis: A Model of a Space-Economy," Review of Economics and Statistics, Vol. XXXIII (November 1951), pp. 318-328; "The General Location Principle of an Optimum Space-Economy," Econometrica, Vol. XX (July 1952), pp. 406-430; "Location Theory and Trade Theory: Short-Run Analysis," Quarterly Journal of Economics, Vol. LXVIII (May 1954), pp. 305-320; Walter Isard and R. Kavesh, "Economic Structural Interrelations of Metropolitan Regions," American Journal of Sociology, Vol. 60 (September 1954), pp. 152-162; Walter Isard and Eugene W. Schooler, Location Factors in the Petrochemical Industry, U. S. Dept. of Commerce, Office of Technical Services, PB111640, Washington, 1955, pp. vi and 106; "General Interregional Equilibrium," Papers and Proceedings of the Regional Science Association, Vol. 3 (1957), pp. 35-60.

associate professor, Department of City Planning, Massachusetts Institute of Technology; William Warntz,[144] formerly instructor in geography and economics, Wharton School, University of Pennsylvania, now research associate on the staff of the American Geographical Society; and others.[145] The American Geographical Society recognized this new trend in geographical research by adding William Warntz to its research staff; his duties according

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144 William Warntz, "A Methodological Consideration of Some Geographic Aspects of the Newfoundland Referendum on Confederation with Canada, 1948," Canadian Geographer, No. 6, 1955, pp. 39-49; "Measuring Spatial Association With Special Consideration of the Case of Market Orientation of Production," Journal of the American Statistical Associations, Vol. 51 (1956), pp. 597-604; "Geography of Prices and Spatial Interaction," Papers and Proceedings of the Regional Science Association, Vol. 3 (1957), pp. 118-129.

145 The following are a few of many examples:

1. Homer Hoyt, "Structure and Growth of Residential Neighborhoods in American Cities," Federal Housing Administration, Washington, 1939.
2. Edgar M. Hoover, The Location of Economic Activity, McGraw-Hill Book Company, New York, 1948.
3. L. C. Dodd, "The Interactance Hypothesis: A Gravity Model Fitting Physical Masses and Human Groups," American Sociological Review, Vol. 15 (1950), pp. 245-256.
4. Leonard C. Yassen, Plant Location, Roslyn, New York, 1952.
5. Donald D. Bogue and Dorothy L. Harris, Comparative Population and Urban Research Via Multiple Regression and Co-variance Analysis, Studies in Population Distribution No. 8 (1954), pp. vii and 75.
6. Rutledge Vinning, "A Description of Certain Spatial Aspects of an Economic System," Economic Development and Cultural Change, Vol. 3, (1955), pp. 147-195.
7. Melvin L. Greenhut, Plant Location in Theory and Practice, University of North Carolina Press, Chapel Hill, 1956, pp. xiii and 338.
8. Edgar S. Dunn, "The Market Potential Concept and the Analysis of Location," Papers and Proceedings of the Regional Science Association, Vol. 2 (1956), pp. 183-194.
9. Earl W. Orr, "A Synthesis of Theories of Location of Transport Rates, and of Spatial Price Equilibrium," Papers and Proceedings of the Regional Science Association, Vol. 3 (1957), pp. 61-73.
10. Charles T. Stewart Jr., "The Size and Spacing of Cities," Geographical Review, Vol. XLVIII (1958), pp. 222-245.

to an annual report of the Society include "a general survey and review of the present application of geographic endeavor of the statistical methodology used in economics, and conversely, of the impact of geographical concepts of spatial distribution to economics." In the past ten years many geographers have contributed geographical studies involving the application of these statistical methods to several aspects of the discipline. Space does not permit a discussion of the statistical methods used or the aspects of geography covered. However, primarily to indicate the breadth of subject matter analyzed by geographers with various statistical approaches, a selected list of these studies since 1951 is cited below.

1. J. Ross Mackay, "Some Problems and Techniques in Isopleth Mapping," Economic Geography, Vol. 27 (1951), pp. 1-9.

2. Allen Rogers, "Industrial Inertia - A Major Factor in the Location of the Steel Industry in the United States," Geographical Review, Vol. XLII (1952), pp. 56-66.

3. John Alexander, "Industrial Expansion in the United States, 1939-1947," Economic Geography, Vol. 28 (1952), pp. 128-142.

4. David I. Blumenstock, "The Reliability Factor in the Drawing of Isarithms," Annals of the Association of American Geographers, Vol. 43 (1953), pp. 289-304.

5. John C. Weaver, "Changing Patterns of Cropland Use in the Middle West," Economic Geography, Vol. 30 (1954), pp. 1-47.

6. John Fraser Hart, "Central Tendency in Areal Distributions," Economic Geography, Vol. 30 (1954), pp. 48-59.

7. Chauncy D. Harris, "The Market as a Factor in the Location of Industry in the United States," Annals of the Association of American Geographers, Vol. XLIV (1954), pp. 315-348.

8. H. H. McCarty, "An Approach to Theory of Economic Geography," Economic Geography, Vol. 30 (1954), pp. 95-101.

9. John C. Weaver, "Crop - Combination Regions in the Middle West," Geographical Review, Vol. XLIV (1954), pp. 175-200.

10. Raymond E. Murphy and J. E. Vance, Jr., "Delimiting the CBD," Economic Geography, Vol. 30 (1954), pp. 189-222.

11. John C. Weaver, "Crop-Combination Regions for 1919 and 1929 in the Middle West," Geographical Review, Vol. XLIV (1954), pp. 560-572.

12. John K. Wright, "Crossbreeding Geographical Quantities," Geographical Review, Vol. XLV (1955), pp. 52-65.

13. Raymond E. Murphy, J. E. Vance, Jr., and Bart J. Epstein, "Internal Structure of the CBD," Economic Geography, Vol. 31 (1955), pp. 21-46.

14. J. Ross Mackay, "An Analysis of Isopleth and Choropleth Class Intervals," Economic Geography, Vol. 31 (1955), pp. 71-81.

15. John H. Thompson, "A New Method of Measuring Manufacturing," Annals of the Association of American Geographers, Vol. XLV (1955), pp. 416-436.

16. William L. Garrison, "The Spatial Impact of Transport Media: Studies of Rural Roads," Reports and Proceedings of the Regional Science Association, Vol. 1 (1955), pp. T1-T14.

17. Arthur H. Robinson, "The Necessity of Weighting Values in Correlation Analysis of Areal Data," Annals of the Association of American Geographers, Vol. XLVI (1956), pp. 233-235.

18. Harold H. McCarty, John C. Hook, and Duane S. Knox, The Measurement of Associations in Industrial Geography, State University of Iowa, Iowa City, 1956.

19. Edward J. Taaffe, "Air Transportation and United States Urban Distribution," Geographical Review, Vol. XLVI (1956), pp. 219-238.

20. William L. Garrison, "Estimates of the Parameters of Spatial Interaction," Papers and Proceedings of the Regional Science Association, Vol. 2 (1956), pp. 280-288.

21. Howard J. Nelson, "Some Characteristics of the Population of Cities in Similar Service Classifications," Economic Geography, Vol. 33 (1957), pp. 95-108.

22. Arthur H. Robinson and Reid A. Bryson, "A Method of Describing Quantitatively the Correspondence of Geographical Distributions," Annals of the Association of American Geographers, Vol. 47 (1957), pp. 379-391.

23. John W. Alexander, S. Earl Brown, and Richard E. Dahlberg, "Freight Rates: Selected Aspects of Uniform and Nodal Regions," Economic Geography, Vol. 34 (1958), pp. 1-18.

24. Brian J. L. Berry and William L. Garrison, "The Functional Bases of the Central Place Hierarchy," Economic Geography, Vol. 34 (1958), pp. 145-154.

25. John W. Alexander, "Location of Manufacturing: Methods of Measurement," Annals of the Association of American Geographers, Vol. 48 (1958), pp. 20-26.

26. Brian J. L. Berry and William L. Garrison, "Alternate Explanations of Urban Rank-Size Relationships," Annals of the Association of American Geographers, Vol. 48 (1958), pp. 83-91.

PART IV GEOGRAPHICAL SOCIETIES OF THE UNITED STATES

The preceding pages have dealt in summary fashion with geographers and the geographic work in business organizations, government agencies and in colleges and universities, although no separate analysis was made of the research of staff members of departments of geography. In bringing together geographical

data through many types of surveys, studies and census reports and in disseminating these data, government agencies probably accomplish more than academic institutions and geographical societies together. The research accomplished and publications issued by members of departments of geography in the United States exceed those of the geographical societies combined. However, as pointed out above, geographical research in government agencies (also in most business organizations) is largely for the purpose of applying geographical information to specific operations -- administrative, military, political, economic, or social -- whereas that in university departments and geographical societies is concerned chiefly with the development of geography as a distinct science or discipline and with the dissemination of geographical information as such. Furthermore, geographical research projects by government for the most part must be projected and carried out so as to meet directly governmental requirements, whereas the professor of geography and the geographical society for the most part have a large measure of freedom of choice as to the kind of research they wish to pursue; and their motivation in research generally comes not from utilitarianism, or the practical application of the results of their investigations, but rather scholarly interest.

Of the several geographical societies in the United States this section will deal primarily with four: The Association of American Geographers, founded in 1904; The National Council for Geographic Education (founded in 1914 as the National Council of Geography Teachers -- name changed at annual meeting on November 22-24, 1956); The American Geographical Society of New York, founded in 1852; and The National Geographic Society, founded in 1888.[146] The first two are distinctly professional societies, their memberships being made up almost entirely of professional geographers

146 In addition to these there are several local laymen's geographical societies, such as the Geographic Society of Chicago and the Geographical Society of Philadelphia. The former published irregularly a Bulletin of geographic research and other articles until the middle 1930's and the Geographical Society of Philadelphia published a quarterly Bulletin from 1893-1939. Yet, the major function of these societies has always been offering each year a series of travel lectures. There are also several regional and state geographical societies, or geography sections in state academies of science. The Association of Pacific Coast Geographers is an example of a regional professional group. Since 1935 it has published annually a Yearbook containing geographical articles and news items.

United States geographers participate actively in at least two international geographical organizations: the Commission on

and teachers of geography. Many geographers are members of both societies. The Association of American Geographers is largely a professional research society; the National Council for Geographic Education, a professional educational society. The American Geographical Society and the National Geographic Society may be termed laymen's societies; many geographers are members of both of them, but in the case of the latter, most of its large membership consists of persons other than geographers. Both of them are research societies; the American Geographical Society is considered more a research society than the National Geographic Society, even though the latter promotes large and significant research projects. These two societies employ most of the geographers who are engaged full-time in magazine publication in the United States. The above four societies are national in scope - national in that they draw membership from all parts of the United States, and in that geographers throughout the country refer to their publications for the continuing advances in the discipline.

These four societies have certain common objectives or activities. The first and major objective of all of them is the dissemination of geographical knowledge, particularly newly acquired geographical information. This objective is achieved through publication and meetings. The American Geographical Society and

146(Cont.)

Geography of the Pan American Institute of Geography and History and the International Geographical Union. Members of the NAS-NRC Advisory Committee on Geography to the Department of State for the Commission on Geography of the Pan American Institute of Geography and History are listed on p. ii of this report. Members of the National Committee of the United States for the International Geographical Union are: Wallace W. Atwood, Jr., Chairman, Clarence F. Jones, Vice-Chairman, Walter W. Ristow, Secretary-Treasurer, Newman Bumstead, Arthur L. Burt, Edwin J. Foscue, George Kish, Osborn Miller, J. Warren Nystrom, Louis O. Quam, Samuel van Valkenburg, Guido Weigend, George D. Whitmore, and Chauncy D. Harris (ex officio).

the National Geographic Society accomplish this objective mainly through their publications; with them meetings are secondary.[147] In contrast, the Association of American Geographers and the National Council for Geographic Education accomplish their more influential results through presentation and discussion of papers at annual and regional meetings and through the work of committees; yet their publications have a great influence on the advancement of the discipline. A second common objective is stimulation and recognition of research and educational achievement by awards, such as research grants, medals and citations. These societies have special funds to be used for such purposes, but each of them could render greater service to geography with additional substantially larger gifts. Although given very unequal emphasis by the four societies, a third objective is a variety of activities aimed at securing the improvement of the teaching of geography in schools at all levels, of protecting the interests of all geographers, and of advancing geographical research in universities, institutions, government agencies and business organizations. The Association of American Geographers and the National Council for Geographic Education do more than the two other two in the first two of these activities; the Association of American Geographers is the only one with a placement service. The Association of American Geographers and the American Geographical Society do more in the third activity than the other two societies. With adequate permanent headquarters and large permanent staffs the American Geographical Society and the National Geographic Society are able to collect and maintain large collections of geographical books, maps, photographs and other geographical material. Also, these societies for many years have been engaged in significant exploration and cartographic projects. Obviously, as societies, the Association of American Geographers and the National Council for Geographic Education with annual changes of officers and without permanent headquarters are unable to engage in such activities.

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147 For a more detailed statement on the character of these and other geographical societies see John K. Wright, "The Field of the Geographical Society," in Griffith Taylor (editor), Geography in the 20th Century, (third edition), The Philosophical Library, New York, 1957, pp. 643-665, and John K. Wright, "The Educational Functions of the Geographical Societies of the United States," Journal of Geography, Vol. 47 (1948), pp. 165-173.

Association of American Geographers[148]

Since its organization in 1904 the AAG has attempted to further research in Geography and to encourage the application of geographic findings in education, government and business. The principal criterion for membership is mature professional activity in the field of Geography, and most of the 2,000 members have graduate degrees plus some years of experience in the application of their training.

The principal publications of the Association are: (1) its quarterly journal, The Annals of the Association of American Geographers, for research papers of high quality, now in its 48th year; (2) its bi-monthly news journal, The Professional Geographer, which carries short articles on techniques and other matters, news items of the annual and divisional meetings, committee reports, news of university departments and other centers of geographic work, notices of new publications, individual personal news items, and lists of Ph. D. dissertations completed and in progress in two issues each year; and (3) monographs such as Richard Hartshorne's Nature of Geography, 5th printing, 1956, and Preston E. James and Clarence F. Jones (editors), American Geography: Inventory and Prospect, published for the Association by the Syracuse University Press, 1954, xii and 590 pages. The Editor of the Annals is Walter M. Kollmorgen; of The Professional Geographer, Evelyn L. Pruitt; of the reviews section of the Annals, Norton S. Ginsburg. The editors of the Association's publications, who are in a position to exercise mature judgment in rejecting, accepting and revising manuscripts for publication, and in selecting books to be reviewed and the persons to review them, exert a profound influence upon holding to high standards and likewise upon the whole development of geographic knowledge.

In 1954 the Association published a pamphlet, "A Career in Geography," 19 pages. Owing to the demand for it, the pamphlet was reprinted in 1957 for the Association by Denoyer-Geppert Company. The establishment of an AAG Monograph Series was approved in 1956 with Dr. Andrew Clark as Editor, and Rand McNally & Company agreed to bear the costs of manufacture, promotion, and sale of the series at the rate of one volume per year as suitable manuscripts are recommended by the Association. Growing interest in Cartography and map use resulted in

148 Much of this section is based on "Some Notes on the Association of American Geographers," by Arch C. Gerlach, Secretary of the Association, September 1957.

the appointment in 1957 of a Map Editor for the Annals (Dr. Erwin Raisz) to expedite the preparation and publication of suitable maps in the Annals. The Association also published a Handbook-Directory of its membership in 1956, including an historical summary, the constitution and by-laws, and an indication of the special fields of interest of the members.

The professional work of the Association is carried out by its individual members and some of its 26 committees, which undertake investigations of specific problems. The Association accomplishes some of its most productive and influential results through the presentation and discussion of papers and projects at the time of the annual and divisional meetings. There are ten divisions of the Association; in the order of number of division members (December 1957) they are: Middle Atlantic, West Lakes, Pacific Coast, East Lakes, New York Metropolitan, New England-St. Lawrence, Southeastern, Southwestern, New York-Ontario, and Great Plains-Rocky Mountains. Each division holds a regular meeting each year, and some of them hold two or more. In a similar manner to that of the editors of the Association's publications, the persons charged with the responsibility of arranging the programs for the annual and divisional meetings exert a significant force on the quality of professional writing and presentation. The geographers actively participating in these meetings take the lead in the development of the methodological and philosophical aspects of geography in the United States. Through the frank discussions and constructive criticisms at these meetings the participants uphold the high standards of achievement in geographical scholarship and education. These meetings also provide a means of concerted action and direct cross-fertilization of ideas.

The problems of organization and administration of the Association are the responsibility of the officers and Council members. The officers for 1957-1958 are: Dr. Lester E. Klimm, President; Dr. Clarence F. Jones, Past President; Dr. Arch C. Gerlach, Secretary; and Dr. Wallace W. Atwood, Jr., Treasurer. In addition, there are 16 Council members, 10 of whom are Chairmen of Regional Divisions, and 6 of whom are elected for terms of three years. Although the officers and council members may frame specific programs, the policy of the Association is determined largely by its membership. The officers and council are an administrative organ of the members, who elect them and to whom they are fully responsible and tactfully responsive.

The Annual Meetings of the Association since 1952 have been at Washington, D. C. (52), Cleveland (53), Philadelphia (54), Memphis (55), Montreal (56), and Cincinnati (57). Future meetings are scheduled for Los Angeles (August 18-22, 1958), Pittsburgh (59), and Dallas (60).

National Council for Geographic Education[149]

The National Council for Geographic Education is the professional "teachers" geographical society of the United States.[150] The main objectives of the National Council for Geographic Education are concerned with studies and research bearing on different aspects of geographic education and on techniques or methods of increasing the effectiveness of teaching geography at various levels, especially in secondary schools and in junior colleges.[151] Without doubt the level of geographical understanding of the people of the United States has been raised greatly by the effective work over many years of the National Council for Geographic Education in advancing the methods of teaching geography. Like the Association of American Geographers, the National Council for Geographic Education accomplishes its most effective results in its annual meetings[152] and in the meetings of its state and regional divisions and through the work of its special committees, that undertake the investigation of specific problems. Most states have a state council of geography teachers.

The administrative functions of the society are carried out by officers, elected annually, and by the Executive Board. Matters of policy are submitted to vote by the members at the General Assembly at each annual meeting. Recent and present Officers of the society are (1) President, M. Melvina Svec 1955, J. Norman Carls 1956, Ina C. Robertson 1957, and Mary Viola Phillips 1958; (2) First Vice-President, Adelbert K. Botts; (3) Second Vice-President, Lorren G. Kennamer, Jr.; (4) Treasurer, John H. Garland; (5) Secretary, John W. Morris. The Executive Board consists of the officers and three elected members.

The realization of the objectives of the National Council for Geographic Education depends to a large degree on the effective

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149 This section is based in part on a letter, June 5, 1957, from Dr. J. Norman Carls, President of NCGE in 1956, and on various issues of the Journal of Geography.

150 By official action of the Executive Board and General Assembly at its annual meeting on November 22-24, 1956, the name of this association was changed from the National Council of Geography Teachers to the National Council for Geographic Education.

151 See John K. Wright, "The Educational Functions of the Geographical Societies of the United States," Journal of Geography, Vol. 47 (1948), pp. 165-173.

152 The annual meeting in November 1955 was in Indianapolis, Indiana; November 1956 in Atlantic City, New Jersey; November 1957 St. Louis; in 1958 it will be in New York City, November 28-29.

organization and performance of its committees. The titles of the current committees indicate the breadth of studies being made. The Research Funds Committee has nearly $9,000 for use in support of research in geographic education. The Distinguished Service Awards Committee each year selects candidates for the award; annually the Distinguished Service Award is given to the person who has made distinguished contributions in geographic education; in 1955 it was presented to J. Russell Whitaker; in 1956 it was presented posthumously in the name of George T. Renner; in 1957, to George B. Cressey. The current investigative committees are: Conservation (Resource Use) Education; Survey of Geographic Education Research; Television in Geographic Education; Tests in Geography; Publication "Careers in Geography"; How To Do It Series; National Exhibit of Student Projects; Geographic Education Service Center for Teachers of Geography; NCGE Advisory Committee for the IGU Report; and Committee to Ascertain the Availability of Topographic Maps. Final reports of committees are published in the Journal of Geography or as special pamphlets.

In order to facilitate the distribution of geographic materials the Council maintains several kinds of publications. The official organ of the Council is the Journal of Geography, published monthly from September to May for the Council by A. J. Nystrom and Company, Chicago. The Journal of Geography is now in its 57th year. Although the main emphasis of the Journal is on methods of geographic education, many of its articles are of a substantive nature; it also carries book reviews and news items of meetings. The Council publishes series of "Special Publications," "Professional Papers," and "Leaflets." One example of each is: (1) "The Status of Geography in the Secondary Schools of the United States," Special Publication No. 4, April, 1956, 12 pages; (2) Phillip Bacon, "Population Growth and Its Impact on Geographic Education," Professional Paper, No. 17, 1958, 9 pages; (3) Mary Viola Phillips, "Organizing a Geography Club in a Secondary School," Leaflet No. 1, 1958.

The American Geographical Society[153]

The main endeavor of the American Geographical Society is to develop and disseminate geographical thought and research. In order to accomplish this, the Society organizes its work under four

[153] This section is based largely on a statement by Charles B. Hitchcock, Director of the American Geographical Society. However, footnotes and brief items were added by Clarence F. Jones to Dr. Hitchcock's statement; much of the information added was obtained from "Selected Publications: American Geographical Society," 12-page leaflet, January 1958; John K. Wright, "The Field of the Geographical Society,"

distinct but coordinated classifications. It maintains (1) an extensive working library and map department (considered to be the most all-inclusive private geographical collection in the Western Hemisphere;[154] (2) a cartographic department expert in the production of special maps; (3) a publication program that includes three periodicals--Geographical Review,[155] Focus,[156] and Cur-

153 (Cont.)
in Griffith Taylor (Editor), Geography in the 20th Century, (Third Edition), The Philosophical Library, New York, 1957, pp. 543-565; and recent issues of the Geographical Review. For a scholarly and thorough account of the American Geographical Society, see John Kirkland Wright, Geography in the Making: The American Geographical Society, 1851-1951, published by the Society, 1952, pp. xxi and 437.

154 See, Nordis Felland, "The American Geographical Society Library," The Professional Geographer, Vol. VII (January 1955), pp. 6-9; Ena L. Yonge, "The Map Department of the American Geographical Society," The Professional Geographer, Vol. VII (March 1955), pp. 2-5. "The American Geographical Society Library in New York City is the largest geographical library in the Western Hemisphere and the third largest in the world. The library contains 251,000 maps, 3,500 atlases, 134,000 volumes, 24,000 pamphlets, and 38,000 photographs." -- Quoted from the Journal of Geography, Vol. 56 (1957), p. 39.

155 The Geographical Review, now in its 106th year, is certainly a leading geographical magazine in the world. Through the years the topics covered definitely reflect the Society's widespread interest in all phases of geography. The interests of the Society have breadth and its activities flexibility, because the Society has never accepted the point of view that a sharp line be drawn between geography and that which is not geography; thus the interests of the Society are not confined to an academic definition of the discipline. The Review presents a more or less balanced survey of the geographical world in its more technical aspects. Of major importance to one engaged in geographical research and one wishing to keep up to date on publications are the sections "Geographical Record" and "Geographical Reviews" in each issue of The Geographical Review.

156 Focus, published monthly, except July and August, since 1950 presents in readable form broad geographical interpretations of areas and resources in the news. Each issue contains a concise and up-to-date analysis of the complex geographical factors relating to an area or a topical subject of current interest. Articles that have appeared on Latin America in Focus are: Brazil, British Caribbean Federation, Chile, Colombia, Paraguay, Puerto Rico, Uruguay, Venezuela, and Resources in the Tropics II - South America.

rent Geographical Publications[157] -- and various research monographs, symposia, and special publications;[158] (4) a research staff, whose members undertake original work, assist in the

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157 Another outstanding service of the American Geographical Society to geographers and also to workers in many allied fields is the Current Geographical Publications: additions to the research catalogue of the Society, issued monthly except June, July and August. Each issue contains listings of some 500 books, articles and maps, organized according to the systematic and regional classification schemes of the Society.

158 The American Geographical Society has published a total of about 70 books in its Special, Research, Library and Others Series. Among the significant publications since 1950 are the following:

1. Wallace E. Pratt and Dorothy Good (Editors), World Geography of Petroleum, published for the American Geographical Society by the Princeton University Press (Special Publication No. 31, 1950), pp. xvii and 464.
2. A. Grenfell Price, White Settlers in the Tropics, (Special Publication No. 23, reproduced by lithoprint, 1951), 326 pp.
3. Charles Seymour, Geography, Justice and Politics at the Paris Conference of 1919, (Bowman Memorial Lectures, Series One, 1951), pp. iv and 24.
4. John Kirtland Wright, Geography in the Making: The American Geographical Society, 1851-1951, published by the Society, 1952, pp. xxi and 437.
5. L. Dudley Stamp, Land For Tomorrow: The Underdeveloped World, published jointly by the Indiana University Press and the American Geographical Society, 1952, 230 pp.
6. Carl O. Sauer, Agricultural Origins and Dispersals, (Bowman Memorial Lectures, Series Two, 1952), pp. v and 110.
7. Manual for the Classification and Cataloging of Maps in the Society's Collection, (Mimeographed and Offset Publication No. 4, revised 1952), 43 pp.
8. Readings in the Geography of North America: A Selection of Articles from the Geographical Review, (Reprint Series 5, 1952), 466 pp.
9. H. W:son Ahlmann, Glacier Variations and Climatic Fluctuations, (Bowman Memorial Lectures, Series Three, (1953), pp. v and 51.
10. George H. T. Kimble and Dorothy Good (Editors), Geography of the Northlands, published for the Society by John Wiley & Sons, New York, (Special Publication No. 32, 1955), 534 pp.
11. Stephen Haden-Guest, John K. Wright, and Eileen M. Teclaff (Editors), A World Geography of Forest Resources: a symposium by 34 contributing authorities, published for (Special Publication No. 33, 1956, xvii and 736 pp.

editing of the Society's publications, maintain contact with the discipline as a whole, and answer technical inquiries. The personnel in each group in many cases hold office or otherwise participate in the activities of other professional and scientific organizations; for example, the Association of American Geographers, Special Libraries Association, National Academy of Sciences-National Research Council, American Association for the Advancement of Science, American Society of Photogrammetry, International Society for Geographic Pathology, Pan American Institute of Geography and History, and so on.

The Society has undertaken contracts for various government agencies. In particular, much of its long-term research activity has been made possible by the support of the Office of Naval Research. Recently, owing to a grant-in-aid from The Ford Foundation, the Society has been in a position to enlarge the scope of its research program independent of government contract, and to bring promising young scientists into the staff.

The Society has research projects both in the physical and the cultural aspects of geography. Special emphasis is being given at the present time to the use of mathematics, not only in cartography, but in the development of geographical-economic theory.[159] Investigation is currently being made of the relationship of vegetation to environmental control by the use of pollen, spore, and peat stratigraphy to reconstruct earlier environments. A book on the ecology of human diseases is in the course of preparation. A field of special interest has been glaciology and its relationship to climatology. In this connection, the Society has recently completed a study of mountain glaciers in the Northern Hemisphere, and is continuing its long-term Juneau Ice Field Research Project in glaciology, botany, and related disciplines. During the International Geophysical Year the Society's Juneau Ice Field base camp was operated as one of the United States glaciological stations. In addition, the Society sent into the field two glaciological expeditions under the auspices of the IGY, and acted as a World Data Center for IGY activities in glaciology. Among the special publications, an important endeavor is the preparation of regional handbooks on Finland[160], Egypt, India, Pakistan, and Thailand.

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159 See, John Q. Stewart and William Warntz, "Macrogeography and Social Science," Geographical Review, Vol. XLVIII (1958), pp. 167-184.

160 Raye R. Platt (Editor), Finland and Its Geography, published for the Society by Duell, Sloan and Pearce, New York, and Little, Brown and Company, Boston, (Handbook Series No. 1, 1955), pp. xxv and 510.

In the cartographic field, although the Society's "Map of Hispanic America," on the scale of 1:1,000,000, has been completed as originally conceived, many of the sheets have been revised and ten others are awaiting publication. The Society has extended its series of sheets on the scale of 1:5,000,000, initiated with the "Map of the Americas," on this scale, to cover Europe, Africa, and Antarctica. The Antarctic map was officially adopted by the IGY for use in the field by all scientists.[161] A major cartographic objective of the Society is to complete the mapping of the world on this scale, thereby providing a much-needed continuous base, not only for use by geographers, but by scientists in other disciplines, businessmen, government officials, and the like. In this connection, a pilot project has already been initiated to demonstrate the value of such a map in coordinating the collection of data and research in climatology throughout the world.

National Geographic Society[163]

The National Geographic Society has a membership of well over 2 1/4 million, residing in some 160 countries, making it the largest geographical society in the world. Having the largest and most heterogeneous membership of any geographical society, the National Geographic Society has come farthest in adapting its program to the prevailing level of its members' tastes. There have been several notable periods of growth in the 70-year history of the Society, but the largest of these is without doubt the great interest in geography which literally exploded during and immediately after World War II, which generated an unprecedented interest in geography throughout the world, but particularly by the American men and women who were in the armed services and government, and also by their families at home.

The main objectives of the National Geographic Society are the increase and dissemination of geographic knowledge. The members receive the Society's official monthly journal, the

161 Laurence M. Gould, "Antarctic Prospect," Geographical Review, Vol. XLVII (1957), pp. 1-28.

162 The report on the National Geographic Society is based almost entirely upon "The National Geography Society and Its Magazine," A History by Gilbert Grosvenor and an Account of the Society's Activities Today by John Oliver La Gorce, National Geographic Society, Washington, 1957, pp. xi and 196; report by Windsor P. Booth on the Society-Sponsored Research Projects.

National Geographic Magazine, largely illustrated in color, containing reports of its expeditions, accounts of travel and exploration, and also articles on many phases of science, especially on natural history. Also, the Society distributes to its members, four and some times five times a year, maps of various sections of the globe of timely interest, published as supplements to the Magazine. These maps are drawn by the Society's own large cartographic staff and are based on the most accurate and up-to-date information obtainable from official and other reliable sources throughout the world. The Society also publishes monographs[163] presenting the technical results of expeditions and research projects sponsored or assisted by the Society. Since its founding the National Geographic Society has sponsored and supported more than 100 expeditions and research projects which have made many valuable contributions to geographic knowledge.[164] In addition, as part of its educational work, the Society makes available to hundreds of newspapers and press associations background material and geographical information on places and areas featured in the world news. Furthermore, it provides to some 30,000 American schools a weekly bulletin of similar content, illustrated with photographs and maps, with no cost except that for mailing.

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163 Among book and monograph publications of the Society since 1951 are the following:

1. The World in Your Garden: A story of our familiar flowers, fruits, and vegetables; their origins and history, 1957, 248 pp.
2. Indians of the Americas, (Third printing), 1957, 432 pp.
3. Everyday Life in Ancient Times, (Second printing), 1953, 356 pp.
4. John Oliver La Gorce and others, The Book of Fishes, 1952, 340 pp.
5. Your National Gallery of Art After Ten Years: Reproductions of 24 paintings in the National Gallery of the Smithsonian Institution, 1952, 31 pp.
6. Williamsburg: Its College and Its Cinderella City, 1954, 48 pp.
7. Ancient Mesopotamia: A Light That Did Not Fail, the story, from archeological findings, of the beginning of Western civilization, 1951, 65 pp.
8. American Processional: History on Canvas - The Growth of the United States depicted in 33 renowned paintings, 1951, 40 pp.

164 "Expeditions of the National Geographic Society," in Gilbert Grosvenor and John Oliver La Gorce, op. cit., pp. 157-185.

Certain Current Approved National Geographic Society-Sponsored Research Projects[165]

1. Joint study during 1956 of the life histories of pelagic fishes of the Florida region by the NGS and the Marine Laboratory of the University of Miami (Florida). Proposed November 22, 1955, by Dr. G. G. Walton Smith, Director of the Marine Laboratory; approved December 12, 1955 by the Research Committee. Project completed.

2. A study of neotropical butterflies, with emphasis on the Family Heliconiicae, in Trinidad, British Guiana, Surinam, and Brazil under sponsorship of the NGS and the Department of Tropical Research, New York Zoological Society. Application submitted February 7, 1956; approved by the Board of Trustees April 18, 1956. Project completed.

3. A joint expedition by the NGS and American Museum of Natural History, under the leadership of E. Thomas Gilliard, to study and collect flora and fauna of New Britain Island during 1958. Proposed March 23, 1956; approved by the Research Committee December 11, 1956.

4. Joint NGS-Smithsonian Institution expedition for archaeological and ethnological studies in northwest Ecuador, particularly the provinces of Esmeraldas and Manabi, led by Dr. M. W. Stirling, Director, Bureau of American Ethnology, Smithsonian Institution. Proposal submitted September 27, 1956; approved by the Research Committee September 25, 1956. Project completed.

5. Entomological studies by Dr. Paul A. Zahl in the Amazon Basin. Proposal submitted October 6, 1956; approved by Board of Trustees November 15, 1956. Work started in October, 1957.

6. A visit to the National Museum of Mexico City by Dr. Robert F. Heizer and Mr. Robert Squier of the Department of Anthropology, University of California, to compare artifacts taken from La Venta (Mexico) with those from the Valley of Mexico. Application made December 3, 1956; approved by Research Committee December 11, 1956. Project completed.

7. Entomological expedition to survey the insect order Embioptera in Equatorial Africa, to be led by Dr. Edward S. Ross, Curator, Department of Entomology, California Academy of Sciences. Proposal submitted February 21, 1957; approved by Research Committee March 29, 1957. Work to begin in July, 1957, and continue through the spring of 1958.

8. Joint NGS-University of California archaeological investigations at Cuicuilco, Valley of Mexico, during 1957. Expedition led by Dr. Robert F. Heizer, Department of Anthropology, University of California. Proposal submitted March 19, 1957; approved by Research Committee Mrrch 29, 1957. Work now in progress.

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[165] This list was presented in a letter June 26, 1957 by Windsor P. Booth.

9. Geo-archaeological investigations at the Winnemucca Caves, Lake Lahontan, Nevada, during the summer of 1957 under the joint sponsorship of the NGS, Western Speleological Institute, and Nevada State Museum, led by Dr. Phil C. Orr of Western Speleological Institute. Proposal submitted April 13, 1957; approved by Board of Trustees June 19, 1957. Project now in progress.

10. NGS-National Bureau of Standards expeditions to Mauna Loa, Hawaii, directed by Dr. C. C. Kiess. Spectrographic study of Martian atmosphere (1956), and the atmosphere of Jupiter (1957).

11. Joint NGS-Smithsonian Institution project to explore and excavate archeological site at Russell Cave, Jackson County, Alabama. Begun in 1956, work now in progress.

12. Joint NGS-Lowell Observatory expeditions to Bloemfontein, South Africa, in 1954 and 1956 to observe Mars at its most favorable opposition since 1939 and until 1971. Directed by Dr. E. C. Slipher.

13. Cosmic Ray Mapping Program, 1956-58. Jointly sponsored by NGS and the Bartol Research Foundation of Philadelphia's Franklin Institute, in collaboration with the National Research Council of Canada. For studies of cosmic rays by monitors on merchant ships from September, 1956, through the International Geophysical Year.

14. Continuation of the NGS - Calypso Marine Archeological studies, begun in 1952.

Conclusions with Respect to the Work of the Geographical Societies

As has been pointed out above, the four geographical societies discussed have made outstanding contributions in their respective fields of endeavor. Concerning the work of the geographical societies in the years ahead the writer of most of this report wishes to quote from John K. Wright.[166]

"Certainly there are many worthwhile things which the geographical societies might do that they are not now doing. In the field of research it is not difficult to conceive of large-scale projects of the first importance that a laymen's research society, if amply endowed, could carry forward to better advantage than other institutions. The cartographic facilities of such a society could be devoted to the production of scholarly atlases or comprehensive series of maps of types that governments or commercial publishers cannot undertake - for example, a national atlas of the United States, a general historical atlas, a compendium of statistical maps of the Americas. Another mode of research well suited to the laymen's research society is the collaborative investigation of problems that affect large parts of the world and

166 John K. Wright, "The Field of the Geographical Society," in Griffith Taylor (Editor), Geography in the 20th Century, (Third Edition), The Philosophical Library, New York, 1957, pp. 564-565.

in which geographical factors are of great importance - problems, for example, connected with land settlement and tenure, with public health and disease, with the destructive and constructive utilization of natural resources, with differential levels of living, with international relations.

"Alluring avenues might also be followed in the field of geographical education. Despite the good work that the geographical societies have already done, a vast domain of black geographical illiteracy prevails among the general public and extends even into the ranks of college graduates. There are countless enterprises in which the geographical societies might take the lead towards remedying this deplorable and dangerous state of affairs: for example, the establishment of museums of regional and systematic geography, or the development of new equipment for geographical education, such as travelling exhibits, film strips, motion pictures, (including animated maps and geographic diagrams), globes, dioramas, and demonstrations. Much could also be accomplished towards the improvement of books, maps, and other geographical publications designed for use in the schools and for popular and semi-popular reading. The proper function of the geographical societies in such enterprises would not be to compete with the commercial firms in the large-scale production of such materials, but rather to set standards and through pioneer experimental undertakings to open new fields.

"The chief obstacles in the way of the expansion of the activities and influence of the geographical societies along such lines is not lack of ideas or of vision, but of funds and personnel. The future effectiveness of the geographical societies will depend partly on their ability to convince the public of their need for far more adequate financial support than they are now receiving, and partly on their ability to secure competent scholars to work for them. To do these things poses a serious but not insuperable problem. The future effectiveness of the geographical societies is also predicated on one more necessary assumption: that they continue to preserve their two priceless assets, freedom of scientific choice and disinterestedness of scientific motivation."

APPENDIX

Dissertations with a Locale in Latin America and in the United States

At a regular meeting of the NAS-NRC Committee Advisory to the Department of State for the Commission of Geography members of the Committee in discussing the character of the United States National Report to be presented at the next Consultation on Geography suggested that for the information of our Latin American Colleagues that author-title-and-university of all dissertations on Latin America and those on the United States be included. In line with this suggestion they are listed by years without comment.

Dissertations on Latin America and on the United States in 1952

Latin America

Akin, Wallace E. "The Dairy Industry of the San Juan Area of Puerto Rico," Northwestern University.

Danklefsen, Mildred Marie. "The Sugar Industry of Jamaica," Clark University.

Gulick, Luther. "Rural Occupance in Utuado and Jujuya Municipios, Puerto Rico," University of Chicago.

Kennelly, Robert A. "The Location of the Mexican Steel Industry," State University of Iowa.

Krause, Annemarie. "Mennonite Settlement in the Paraguayan Chaco," University of Chicago.

United States

Atruski, Siddik. "Study of Irrigation Problems in Idaho," Clark University.

Becht, J. Edwin. "Commodity Origins, Traffic and Market Accessibility to Chicago Via the Illinois Waterway," University of Illinois.

Beimfohr, Oliver W. "The Industrial Potential of Southern Illinois," Ohio State University.

Brown, Albert W. "Areal Relationships Between Land Use, Population and Political Jurisdictions Along a Segment of the Vermont-New York State Boundary," Syracuse University.

Brush, John Edwin. "The Trade Centers of Southwestern Wisconsin," University of Chicago.

Cramer, Robert Eli. "Manufacturing in Cicero, Illinois," University of Chicago.

Frank, Ralph W. "The Rubber Industry of the Akron-Barberton Area: A Study of the Factors Related to its Development, Distribution and Localization," Northwestern University.

Gehrke, Willis T. "The Freight Traffic Geography of the Seaboard Airline Railway," University of Wisconsin.

Griffin, Paul F. "Richard Elwood Dodge - His Life and Contributions to Geography," Teachers College, Columbia University.

Grove, Arthur Melvin. "A Study of the Geography Courses Offered in a Selected Number of American Colleges and Universities in 1949-1950," University of Kentucky.

Hahn, Arvin William. "The South Holland Onion Set Industry: A Study of Specialized Horticulture," Northwestern University.

Hamming, Edward. "The Port of Milwaukee," University of Chicago.

Heintzelman, Oliver Harry. "The Dairy Economy of Tillamook County, Oregon," University of Washington.

Jackson, W. A. Douglas. "The Lands Along the Upper St. Lawrence: Canadian American Development During the Nineteenth Century," University of Maryland.

Kaatz, Martin R. "The Settlement of the Black Swamp of Northwestern Ohio," University of Michigan.

Khalaf, Jassim M. "The Water Resources of the Lower Colorado Basin," University of Chicago.

Langdon, George L. "The Mesabi Iron Ore District and the Northern Anthracite Field," Clark University.

Melvin, Ernest E. "Problems Related to the Development of the Greenfields Irrigation District, Fairfield, Montana," Northwestern University.

Miller, Elbert Ernest. "Agricultural Geography of Cache Valley, Utah," University of Washington.

Pappas, George R. "Some Socio-Geographic Factors Pertaining to the Spread of Urbanism in the San Fernando Valley," University of Maryland.

Phillips, Yvonne. "Settlement Succession in the Tensas Basin, Louisiana," Louisiana State University.

Rhynsburger, Willert. "The Puget Sound Drift Plain: Land Resources and Human Occupance," University of Washington.

Schmidt, Nicholas J. "Structures and Functions of Mattoon, Illinois," University of Illinois.

Shear, James. "Variability of Monthly Precipitation from the Long Period Mean in the United States," Clark University.

Taaffe, Edward James. "Air Passenger Hinterland of Chicago," University of Chicago.

Vance, James Jr. "A Type Study of Dynamic Suburban Geography in the Motor Age," Clark University.

Dissertations on Latin America and on the United States in 1953

Latin America

Beishlag, George A. "Trends in Land Use in Southeast Puerto Rico," University of Maryland.

Carmen, Robert L. "Urban Pattern and Regional Function of Anapolis, Goiaz, Brazil," University of Chicago.

Doran, Edwin J. "A Physical and Cultural Geography of the Cayman Islands," University of California, Berkeley.

Wagner, Philip. "Nicoya: Historical Geography of a Central American Lowland Community," University of California, Berkeley.

Wills, Bernt Lloyd. "Land Utilization in the North Central Area of Puerto Rico - Bayamon to Vega Baja," Northwestern University.

Young, Robert N. "Classification of Land Forms of Puerto Rico," University of Wisconsin.

United States

Bajza, Charles C. "The Regional Geography of Powder River Basin, Wyoming and Montana," Indiana University.

Basile, Robert M. "The Oahe Unit: A Proposed Irrigation Project in a Subhumid Glaciated Region," Ohio State University.

Bradac, Joseph G. "Recreational Study of the Black Hills," University of Michigan.

Bradley, John Ashmore. "Park Ridge Manor, Illinois: An Analysis of the Problems of an Unincorporated Settlement in the Urban-Fringe," Northwestern University.

Brueckheimer, William Rogers. "Study of Recreational Significance in Alger County, Michigan," University of Michigan.

Bush, Phillip M. "Geographical Aspects of Petroleum Transportation With Special Reference to the Upper Mississippi Valley," University of Illinois.

Bushman, Donald Otto. "The Ecological Significance of Ohio's Climate," Ohio State University.

De Long, George C. "The Northeastern Illinois Dairy Region," University of Michigan.

Erickson, Sheldon D. "Occupance of the Upper Deschutes Basin, Oregon," University of Chicago.

Drummond, Robert R. "Terre Haute, Indiana: A City of Non-Growth," Northwestern University.

Griffiths, Thomas M. "Geomorphology of Upper Boulder Creek Area, Colorado," Northwestern University.

Guernsey, James Lee. "A Study of the Agricultural and Rural Settlement Pattern of Vigo County, Indiana, with Emphasis on the Impact of Strip Coal Mining," Northwestern University.

Hanlon, Eleanor. "Upper Susquehanna Valley, New York," Clark University.

Harris, William N. "Newark, Ohio and Its Environs," Ohio State University.

Heppel, Roger C. "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," Pennsylvania State University.

Hunker, Henry Louis. "Columbus, Ohio: The Industrial Evolution of a Commercial Center," Ohio State University.

Kaikow, Julius. "Legal and Administrative Status of Conservation Education in the U. S.," Teachers College, Columbia University.

Kazek, M. "Regional Geography of North Dakota," Teachers College, Columbia University.

Laine, Oliver H. "A Comprehensive Land Use Survey of the Towson Community Area, Maryland," Clark University.

Loeffler, Manuel John. "Phases in the Development of the Land-Water Resources in an Irrigated River Valley, Colorado," University of Washington.

Miller, David. "Snow Cover and Climate in the Sierra Nevada, California," University of California, Berkeley.

Moore, Fleming Stanley. "The Promises and Prospects of Early Agricultural Land Use Programs in Kansas," University of Kansas.

Osborn, David G. "Geographical Features of the Automation of Industry," University of Chicago.

Patton, Clyde. "Climate of Summer Fogs of the Bay Area, California," University of California, Berkeley.

Rasche, Herbert F. "Temperature Differences in Harvard Forest and Their Significance," Harvard University.

Rudd, Robert Dean. "Glacial Deposits of the Yorkville, Illinois Quadrangle," Northwestern University.

Thoman, Richard S. "The Changing Occupance Pattern of the Tri-State Area, Missouri, Kansas, and Oklahoma," University of Chicago.

Zobler, Leonard. "Man-Land Relations in Salem County, New Jersey: A Study in Quantitative Geographic Regionalism," Columbia University.

Dissertations on Latin America and on the United States in 1954

Latin America

Arnold, Brigham A. "Landforms and Early Human Occupance of the Lake Chapala Region, Baja California," University of California, Berkeley.

Aschmann, Harold H. "The Ecology, Demography, and Fate of the Indians of the Central Desert of Baja California," University of California, Berkeley.

de Laubenfels, David John. "The Temuco Region: A Geographic Study in South Central Chile," University of Illinois.

Dozier, Craig Lanier. "Northern Parana, Brazil: Settlement of a Recent Frontier Zone," Johns Hopkins University.

Eidt, Robert C. "Land Utilization in the Highland Basins of the Cordillera Oriental of Colombia," University of California, Los Angeles.

Fisher, Albert L. "Recent Political and Economic Geography of Surinam, with Emphasis on Development Possibilities," Johns Hopkins University.

Gordon, B. Leroy. "Historical Geography and Ecology in the Sinu Country of Colombia," University of California, Berkeley.

Netzer, Donald L. "Climate and Agricultural Cropland Use in Puerto Rico," University of Illinois.

Patten, George Phillip. "The Agricultural Land Use and Farming Practices in the Managua Region of Nicaraugua," Northwestern University.

United States

Baker, Virgil R. "Agricultural Conservation in Castle Valley, Utah," University of Utah.

Bingham, Edgar. "Land Utilization in the New and Watauga River Basins of North Carolina," Ohio State University.

Bordne, Erich F. "Water Use Relationships in the Genessee Valley and Western Lake Ontario Basin," Syracuse University.

Brooks, Hugh C. "Directed Studies in Introductory College Geography," Teachers College, Columbia University.

Burns, Bert E. "Artificial Drainage in Blue Earth County, Minnesota," University of Nebraska.

Byron, William G. "Methods of Mapping Population Distribution by Dots and Densitometer-Derived Isopleths," Syracuse University.

Chestnutwood, Charles M. "The Geographical Bases of Pennsylvania's Tourist Industry," Pennsylvania State University.

Dart, John Olney. "The Renton-Sumner Lowland of Western Washington," University of Washington.

Goodman, Marjorie Smith. "The Aerial Photographic Identification of Farm Crops in Northern Illinois," Northwestern University.

Hoyt, Joseph B. "The Historical Geography of Berkshire County, Massachusetts: A Study of Man's Changing Evaluation of a Physical Setting," Clark University.

Htoo, Tin. "Changes in the Distribution and Functions of Nucleated Settlements in Lewis County, New York, Between 1900 and 1950," Syracuse University.

Illick, John Rowland. "Primary Wood-Using Industries of Northern New England: A Locational Study," Harvard University.

Jacobson, Daniel. "Koasati Culture Changes," Louisiana State University.

Jones, Reece Alexander. "The Inter Coastal Plain of North Carolina -- An Agricultural Region," University of North Carolina.

Kelley, Arthell. "Some Aspects of the Geography of the Yazoo Basin, Mississippi," University of Nebraska.

Kusch, Monica H. "Zion, Illinois, An Attempt at a Theocratic City," University of California, Los Angeles.

McDonald, Walter H. "The Application of the Geographic Method to School District Reorganization in Union County, Illinois," University of Illinois.

McIntire, William G. "Prehistoric Settlements in Coastal Louisiana," Louisiana State University.

Meinig, Donald William. "The Walla-Walla Country: 1805-1910: A Century of Man and the Land," University of Washington.

Natunewicz, Henry. "Political Geography of the Colony and State of Connecticut," Teachers College, Columbia University.

Nelson, Herman L. "Some Aspects of Manufacturing in Worcester, Massachusetts," Clark University.

Pierson, William Haskell. "The Bellingham Lowland," University of Chicago.

Price, Dalias A. "The Commercial Orchard Economy of Sothern Illinois," University of Illinois.

Renner, George T. III. "Geography of the State of Arizona," Teachers College, Columbia University.

Seitz, K. M. "Part-Time Farming in Northern Wisconsin," University of Wisconsin.

Sisco, Paul H. "The Retail Function of Memphis," University of Chicago.

Stanley, Raymond W. "Political Geography of the Yuma Border District," University of California, Los Angeles.

Steiner, William Rodney. "An Investigation of Selected Phases of Sampling to Determine Quantities of Land and Land-use Types," University of Washington.

Stokes, George A. "Lumbering in Southwest Louisiana: A Study of the Industry as a Cultural-Geographic Factor," Louisiana State University.

Dissertations on Latin America and on the United States in 1955

Latin America

Alexander, Charles. "The Geography of Margarita and Adjacent Islands, Venezuela," University of California, Berkeley.

Faissol, Speridiao, "Problema do Desen Volbimento Agricola do Sudeste do Planalto Central (Brasil)," Syracuse University.

Guzman, Louis E. "Farming and Farmlands in Panama," University of Chicago.

Laidig, Kermit M. "Land Use in Southeastern Puerto Rico," University of Nebraska.

Martin, Gene E. "Land Redistribution in Central Chile," Syracuse University.

Sharer, Cyrus. "The Population Growth of the Bahama Islands," University of Michigan.

United States

Aldrich, C. C. "The Geography of Johnston County, Missouri," Louisiana State University.

Bacon, H. Phillip. "The Historical Geography of Ante-bellum Nashville," George Peabody College for Teachers.

Bailey, Perry L. "The Role of the Economic Geography Factors in the Origin and Growth of Grand Rapids, Michigan," Ohio State University.

Case, Dale Edward. "Oak Ridge, Tennessee: A Geographic Study," University of Tennessee.

Chauvin, Robert S. "Geography of Florida," Teachers College, Columbia University.

Classen, Harold Arthur. "A Geographic Study of Power Development in the Niobrara Basin, with Emphasis on Hydroelectric Power," University of Nebraska.

Clevinger, Woodrow Rexford, "The Western Washington Cascades: A Study of Migration and Settlement," University of Washington.

Dunkle, John Robert. "St. Augustine, Florida -- A Study in Historical Geography," Clark University.

Durden, Charles Dennis. "Some Geographic Aspects of Motor Travel in Rural Areas -- Empirical Tests of Certain Geographic Concepts of Location and Interaction," University of Washington.

Durrenberger, Robert W. "Climate as a Factor in the Production of Lemons in California," University of California, Los Angeles.

Flierl, Howard H. "The Land Use of the Middle Schoharie Valley," Syracuse University.

Grotewold, Andreas. "Regional Changes in Corn Production in the United States from 1909 to 1940," University of Chicago.

Hook, John Clinton. "The Relationship Between Roughness of Terrain and Phenomena Related to Agriculture in Northeastern United States," State University of Iowa.

Linehan, Urban Joseph. "Tornado Deaths in the United States," Clark University.

Long, Harriet Ruth. "Distinguishing Features in the Economic Function Profiles of Massachusetts Urban Areas," Clark University.

McArthur, Neil M. "River to Seaway (St. Lawrence) (Relocation of Population as a Consequence), "University of Michigan.

McElhoe, Forrest L. Jr. "A Comparative Study of the Geographic Factors in the Rise of Cities in the Hocking Valley, Ohio, with Special Reference to Their Locations and Sites," Ohio State University.

McIntosh, Charles Barron. "Weather and Coal Mines Explosions," University of Nebraska.

McKnight, Thomas L. "Manufacturing in Dallas -- A Study in Effects," University of Wisconsin.

Moyer, C. Josephine. "The Structure of Greater Reading - An Urban Political Study," Clark University.

Murray, Malcolm A. "A Geographic Analysis of Mortality for Selected Ontario and Ohio-Indiana Cities," Syracuse University.

Nishi, Midori. "Changing Occupance of the Japanese in Los Angeles County, 1940-1950," University of Washington.

Phelps, Jewell A. "Land Utilization in the Lake Dakota Plain," Northwestern University.

Portman, Donald J. "An Investigation of the Theory and Measurement of Heat Transfer in Soil," Johns Hopkins University.

Ransome, Jack Clifford. "The Location of Wholesaling in the Boston Metropolitan Area," Harvard University.

Reinemann, Martin W. "Relocation of Manufacturing Within the Chicago Urban Area: An Analysis Based on a Random Sample of 258 Industries Within 26 Sample Areas Selected at Fixed Intervals Along the Traverse from the Loop to the Northwestern Suburban Fringe," Northwestern University.

Rizvi, Ali I. H. "Comparison Between the Lower Mississippi and Ganges-Brahmaputra Valleys," Louisiana State University.

Stacey, Karl. "Petroleum and Gas in the Economy of Oklahoma," Clark University.

Taylor, James. "Cultural Geography of Southwest Louisi- of Wetlands and Their Damage to the Wabash Lowlands of Indiana," Indiana University.

Thaung, Pe. "Agricultural Land Use in Cayuga County, New York," Syracuse University.

Withington, William A. "The Impact of Residential Growth on Land Use in a Suburb, 1900-1953; Winchester, Massachusetts," Northwestern University.

Dissertations on Latin America and on the United States in 1956

Latin America

Chang, Ching Chieh. "A Geographic Study of the Chinese Population in Latin America," University of Maryland.

Haskins, Edward C. "An Agricultural Geography of the Reconcavo of Bahia," University of Minnesota.

Horst, Oscar Heinz. "An Analysis of Land Use in the Rio Samala Region of Guatemala," Ohio State University.

Rothwell, Stuart C. "The Caxias Area, Rio Grande do Sul (Brazil)," Syracuse University.

United States

Ahmed, G. Munir. "Manufacturing Structure and Pattern of Waukegan - North Chicago," University of Chicago.

Arbingast, Stanley Alan. "A Geographic Study of the Pattern of Manufacturing in Texas," University of Washington.

Blick, James D. "An Analysis of Cotton Production in the San Joaquin Valley, California," University of California, Los Angeles.

Boas, Charles W. "Cameron County: An Empty Area of the Allegheny Plateau," University of Michigan.

Brand, Paul J. "Geographic Bases of Land-Use Occupancy in a Micro-Area: Lewisburg, Pennsylvania," Teachers College, Columbia, University.

Brubaker, Harry F. "Land Classification, Ownership and Use in Leon County, Florida," University of Michigan.

Burcham, Levi T. "Historical Geography of the Range Livestock Industry of California," University of California, Berkeley.

Christensen, David E. "Rural Occupance in Transition: Lee and Sumter Counties, Georgia," University of Georgia.

Cordova, Reuben. "Leonia: A Case Study in Planning a Suburban Community," Teachers College, Columbia University.

Court, Arnold. "Statistical Bases of Wind Analysis," University of California, Berkeley.

Dunbar, Gasy S. "Cultural Geography of the North Carolina Outer Banks," Louisiana State University.

Eidemiller, Donald I. "A Climatological Analysis of Frontal Activity in the South-Central United States," Indiana University.

Epstein, Bart J. "The Quincy Food Market: A Study in Marketing Geography," Clark University.

Flannery, James John. "The Graduated Circle: A Description, Analysis, and Evaluation of a Quantitative Map Symbol," University of Wisconsin.

Ford, Robert N. "A Resource Use Analysis and Evaluation of the Everglades Agricultural Area," University of Chicago.

Hazeltine, Jean. "The Historical and Regional Geography of Willapa Bay Area," Ohio State University.

How, George M. "Climates of the North Atlantic," Clark University.

Knipmeyer, William. "Culture Succession in the Settlement of Southeastern Louisiana," Louisiana State University.

Knos, Duane S. "The Distribution of Substandard Housing, Kansas City, Missouri," State University of Iowa.

Lewis, George. "A Technique in Social Geography for the Delimitation of Urban Residential Subregions," Harvard University.

Lewthwaite, Gordon R. "The Regionalization of the Butter and Cheese Industry in Wisconsin," University of Wisconsin.

Logan, Byron Eugene. "An Historical Geographic Study of North Carolina Ports," University of North Crolina.

Marcus, Robert B. "An Analysis of the Programs for the Preparation of Prospective Teachers of Geography in Selected Southern States," University of Florida.

Martin, Kenneth R. "An Analysis of the Broiler Chicken Industry of Delmarva Peninsula," University of Wisconsin.

Ogilvie, Bruce C. "Unincorporated Urban Settlement in Butte County, California," Clark University.

Parmenter, Guy N. "Glacial Water Levels in Narragansett Basin and the Blackstone River Valley," Clark University.

Rumage, Kennard W. "The Palo Verde Valley, A Geographical Analysis of Land-Use Development in the Lower Colorado River Valley, California," University of California, Los Angeles.

Shaudys, Vincent Kirkbride. "A Study of Selected Geographic Factors Adjacent to Topographic Boundaries in South Central Ohio," Ohio State University.

Shreevastava, Mahivara Prasada. "The Industrial Development of Springfield, Ohio: A Study in Economic Geography," Ohio State University.

Sternberg, Hilgard. "The Geography of the False River Area, Pointe Coupee Parish, Louisiana," Louisiana State University.

Webb, George Willis. "The Resources of the Cumberland Plateau as Exemplified by Cumberland County, Tennessee," University of Tennessee.

Wiley, Selva Carter, "The Industrial Geography of the Kanawhe Valley," Ohio State University.

Wright, Martin. "Settlement Succession in Hill, Louisiana," Louisiana State University.

Dissertations on Latin America and on the United States in 1957

Latin America

Drewes, Wolfram U. "The Economic Development of Eastern Peru as Related to Transportation," Syracuse University.

Merrill, Gordon C. "The Historical Geography of St. Kitts and Nevis, B. W. I.," University of California, Berkeley.

Smith, Richard V. "Characteristics and Locational Problems of Puerto Rican Industrialization," Northwestern University.

Wunnie, William. "The Lower Papaloapan Basin: Land and People," University of Florida.

United States

Anderson, Burton Lawrence. "The Scandinavian and Dutch Settlements in the Stilaguamish and Nooksack Valleys of Western Washington," University of Washington.

Beyer, L. Jacquelyn. "An Analysis of the Resource Use Pattern of the Uncompahgre Valley Irrigation Project," University of Chicago.

Brooks, James Eugene. "Settlement Problems Related to Farm Size in the Columbia Basin Project, Washington," University of Washington.

Brown, Robert H. "Political Areal Functional Organization, with Special Reference To St. Cloud, Minnesota," University of Chicago.

Brown, Samuel Earl. "The Wyoming Valley, Pennsylvania, A Study in Changing Economic Structure," University of Wisconsin.

Downs, Margaret B. "Industrial Structure and Pattern of the Wheeling District: Its Evolution and Development, 1840-1950," University of Maryland.

Ebert, Charles H. V. "Soils and Land Use Correlation of the Outer Coastal Plain of Virginia, The Carolinas, and North Georgia," University of North Carolina.

Goodwin, William. "The Middle Passaic Valley: Manufacturing Developments in an Older Economic Region," Columbia University.

Kostbade, J. Trenton. "Geography and Politics in Missouri," University of Michigan.

Laycock, Arleigh H. "A Physiographic Classification of Soils for Land Use Planning on the Eastern Slopes of the Canadian Rockies," University of Minnesota.

Luna, Telesforo W., Jr. "Delimitation of High-Quality Residential Land Use in Worcester, Massachusetts," Clark University.

Murphy, Richard Ernest. "Land Ownership in the Wilderness Areas of the United States national Forests," Clark University.

Noble, Allen George. "A Geographic Analysis of the Development Potential of Rantoul, Illinois," University of Illinois.

Novak, Robert Thomas. "Essentials of Geography: A One Semester Textbook in the Fundamentals of Geography," Teachers College, Columbia University.

Pattison, William D. "U. S. Public Land Survey 1785-1912: A Study in Progress and Procedures of the Survey," University of Chicago.

Perry, Robert Folsom, Jr. "Land Utilization in Sullivan County, New Hampshire: A Critique and Evaluation of the County's Rural Land Resources," Clark University.

Plankenhorn, William F. "A Geographic Study of the Growth of Greater Williamsport (Pennsylvania)," Pennsylvania State University.

Salisbury, Neil E. "A Generic Classification of Landforms In Minnesota," University of Minnesota.

Scott, Thomas William. "Lake Michigan Trainferries and Their Freight Traffic," University of Illinois.

Seawall, Francis. "A Geographical Analysis of Monongahela River Transportation," Pennsylvania State University.

Shuman, Stanley Bloom. "The Forest Resource Situation of the Eastern Part of the Upper Peninsula of Michigan," University of Illinois.

Smith, Marjorie Corrine. "Historical Geography of Champaign County, Illinois," University of Illinois.

Terry, Joseph Elmo. "Geography in General Education: Its Contribution in the Undergraduate General Programs of Selected American Colleges and Universities," University of Denver.

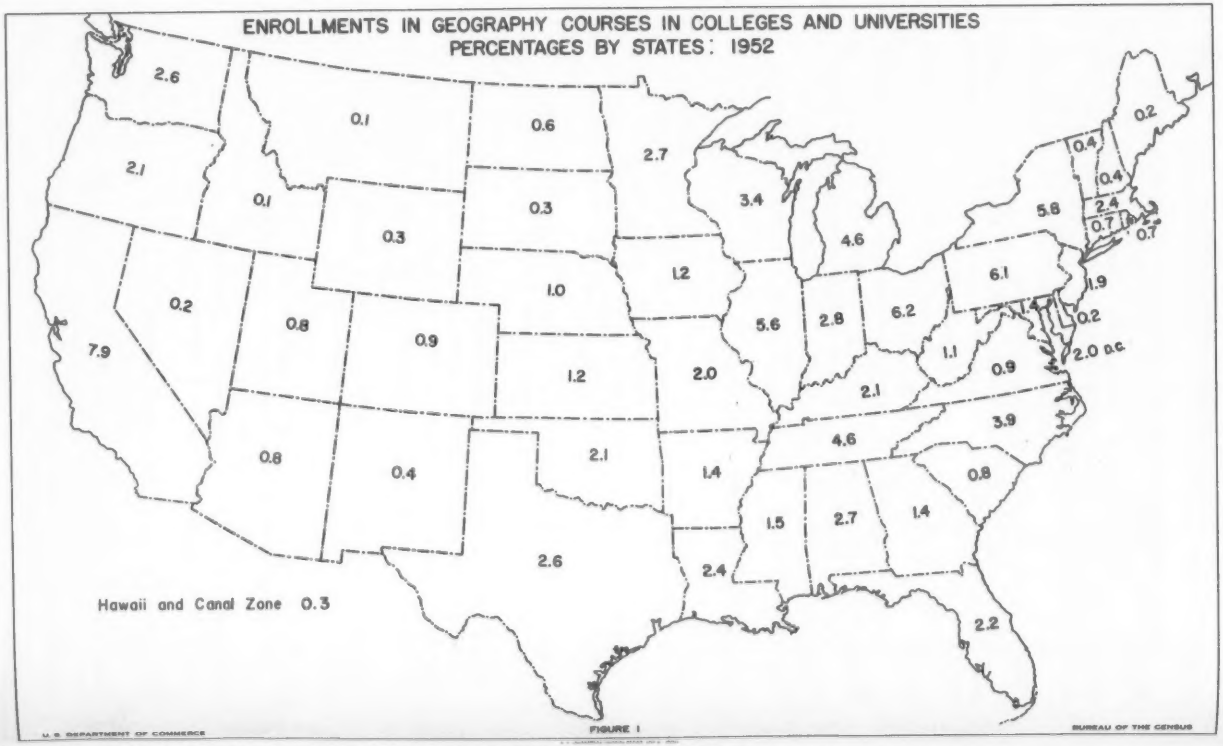
Tuan, Yi-Fu. "The Origin of Pediments in Southeastern Arizona," University of California, Berkeley.

Tucker, Grady Oscar, Jr. "Development of the Central Business Area, Worcester, Massachusetts, with Special Reference to the Retail Sales Function," Clark University.

Tuttle, Jerry. "Ground Water Development in Salt Lake County, Utah," University of Nebraska.

Williams, Robert L. "Statistical Symbols for Maps: Their Design and Relative Values," Harvard University.

Witzig, Frederick T. "A Geographic Study of the Taconite Industry of Northeastern Minnesota," University of Illinois.

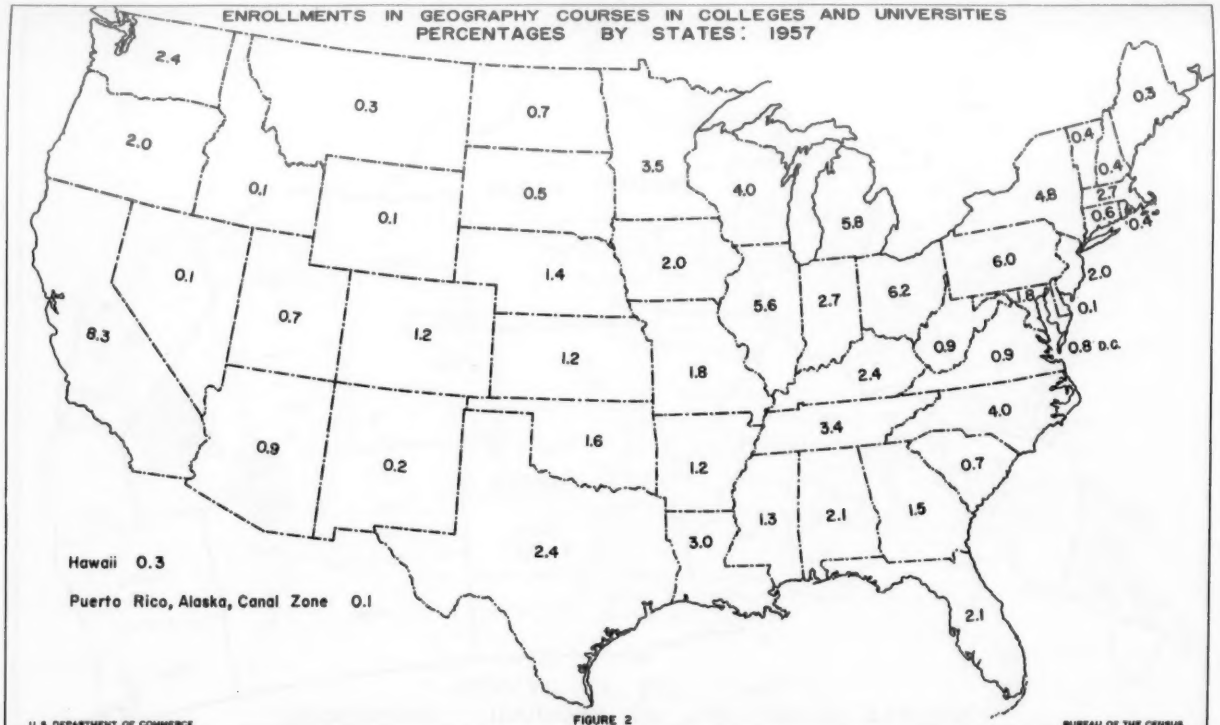

ENROLLMENTS IN GEOGRAPHY COURSES IN COLLEGES AND UNIVERSITIES
PERCENTAGES BY STATES: 1952
2.6
2.1
0.1
0.1
0.6
0.3
0.3
2.7
1.0
1.2
3.4
4.6
5.8
0.2
0.4
0.4
2.4
0.7
0.7
6.1
1.9
0.2
0.2
7.9
0.8
0.9
1.2
2.0
5.6
2.8
6.2
1.1
0.9
2.0 D.C.
2.1
3.9
4.6
0.8
0.4
2.1
1.4
1.5
2.7
1.4
0.8
2.6
2.4
2.2
Hawaii and Canal Zone 0.3
U.S. DEPARTMENT OF COMMERCE
FIGURE 1
BUREAU OF THE CENSUS

U. S. DEPARTMENT OF COMMERCE

FIGURE 1

BUREAU OF THE CENSUS

ENROLLMENTS IN GEOGRAPHY COURSES IN COLLEGES AND UNIVERSITIES
PERCENTAGES BY STATES: 1957



U. S. DEPARTMENT OF COMMERCE

FIGURE 2

BUREAU OF THE CENSUS

GEOGRAPHIC DIVISIONS OF THE UNITED STATES,
BUREAU OF THE CENSUS
WASH.
OREGON
CALIF.
IDAHO
NEV.
MONT.
WYO.
UTAH
ARIZ.
COLO.
N. MEX.
N. DAK.
MINN.
S. DAK.
NEBR.
KANS.
OKLA.
TEXAS
IOWA
MO.
ARK.
LA.
WEST NORTH CENTRAL
WEST SOUTH CENTRAL
WIS.
MICH.
ILL.
IND.
OHIO
KY.
TENN.
MISS.
ALA.
EAST NORTH CENTRAL
EAST SOUTH CENTRAL
N.Y.
PA.
W. VA.
VA.
N.C.
S.C.
GA.
FLA.
MIDDLE ATLANTIC
SOUTH ATLANTIC
MAINE
VT.
N.H.
MASS.
CONN.
R.I.
NEW ENGLAND
MD.
DEL.
N.J.

FIGURE 3

FIGURE 3

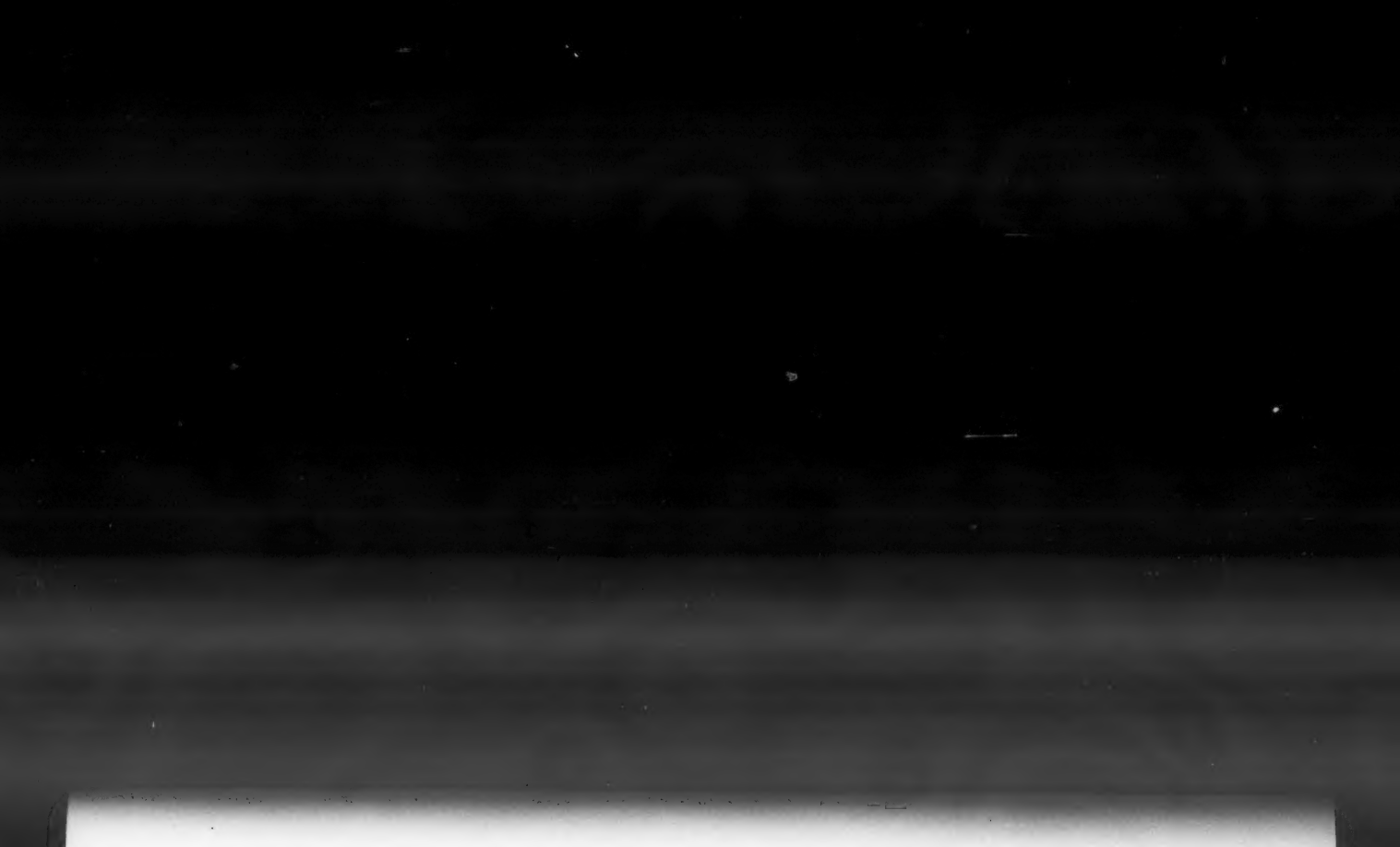



FIGURE 4